The Chemical Age

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Surprising News

WE learn almost as we go to press that Professor Robert F. Ruttan, of the McGill University, Montreal, has been nominated president of the Society of Chemical Industry for next year, in succession to Sir William Pope. This surprising piece of news reaches us from a Canadian source, and is unaccompanied by any account of the circumstances of the selection or of Dr. Ruttan's qualifications for the office. Inquiries among leading members of the Society show that comparatively little is known here of his work, but we are assured that he is a man of distinction with claims fully equal to the position. The Society itself shrinks from throwing any light on the matter, beyond making in the new number of the *Journal* the very casual announcement that Sir William Pope is among the retiring officers. The selection of a Canadian professor is no doubt explained by the forthcoming visit of the Society to Canada, but from this point of view it is doubtful whether the arrangement is the best possible. Dr. Ruttan will really take little part in this year's annual meeting in Canada beyond his election as president. After his election it is unlikely we shall see much of him in England during his year of office, and in a period when chemical interests need to be represented as powerfully as possible in public life the society will, we presume, have to be content with an acting deputy. Similarly Dr. Ruttan—who, if he had been president this year, might have taken a prominent part in arranging the programme for the Canadian and American tour, and would in that case have been in charge of this year's annual meeting—will only come into office practically with the close of the meeting, and will presumably plough a lonely presidential furrow in his own Dominion.

The news, as we have said, will excite surprise and comment. When Sir William Pope's term of office expires something may be said of the distinction and the volume of the service he has rendered to the Society and to chemical interests generally, and of the warmth with which he has everywhere been welcomed. He has been more than a distinguished chemist; he has been a great public man, capable to a degree too rarely found in deeply scientific minds of handling chemical problems on their national side, and in the terms of public life. This latter quality has been of special value during the last year or two. It will be as much needed in the near future, since chemistry seems destined to play an increasing part in national politics as well as in national industry. It is of the highest importance in such times that the representative head and spokesman of chemical industry should be able to address a public much larger than the fraternity of the laboratory, and it would be sheer affectation to pretend that the too early loss of Sir William Pope's services as president will not be widely and deeply felt.

Chemical Engineering

IT was generally agreed at the second annual meeting of the Chemical Engineering Group held this week that the past year had been the most productive yet experienced. The members have been getting down to the actual business the Group set out to undertake, and the first collection of data sheets, reproduced in this issue, supply sufficient evidence of the thoroughness with which the work is being conducted. Everyone recognises the need of the steady development of chemical engineering in this country, and the fact that the Group is our only centre for such development. It is, therefore, to be regretted that the work should be in any degree hampered by troublesome details which divert the controlling minds from the principal task in hand.

The minor troubles, of which something was heard in the discussions this week, are three. First of all,

while the work grows steadily in scope and usefulness, the membership shows a tendency to decline. This, we feel sure, could easily be changed into an advance if the members resolve to make a united effort. The second small trouble is finance. This for the moment is not formidable, but it must recur until the finances are put on a permanently sound basis. Here there was some quite frank speaking on the effect of being incorporated in the Society of Chemical Industry. The effect of this connexion is that the subscription to the Society must be paid before membership of the Group can be obtained, and so far the view is that the Society benefits financially more than the Group. The third trouble is some misunderstanding between the Committee of the Group and the Council of the Society. This is to be regretted from every point of view. Without presuming to judge the merits of the case, it is perhaps permissible to remark that the bonds which unite a parent body to sectional organisations included within its constitution need to be held loosely if they are not to chafe. We have learnt something on this subject from experience with our Overseas Dominions. Federal unity is only possible on the basis of large local autonomy; the attempt to limit or override the latter may end in a definite break. The Council of the Society may usefully consider this suggestion in view of the present feeling within the Group, and of the possible extension of the Group system to other bodies such as the Oil and Colour Chemists' Association.

While the general feeling expressed at Tuesday's meeting was in favour of friendly relations with the Society, the idea of founding an Institution of Chemical Engineers was carried a small but definite step forward. A paper was circulated asking for an expression of opinion on the question, and the replies received left no doubt as to the large degree of support the idea already commands. Professor Hinchley's remarks on the question make his own position and desires quite clear, and he is not the type of man, having once put his hand to the plough, to look back. It is pretty sure we shall hear more of the matter before long.

Experience with Foreign Coal

ALTHOUGH foreign coal, mainly of French and Belgian origin, is now finding its way into this country in fairly large quantities, the position in general chemical works has not materially improved, owing to the fact that the majority of such establishments do not come in for consideration under the Government priority scheme. The public utility services and essential industries are now getting fairly ample supplies for their requirements, but non-essential industries are apparently debarred from sharing in the benefits by the Prime Minister's undertaking that only those services upon which the welfare of the community depends will be kept going in this way. In the first place, it is gratifying to note that the attitude of certain sections of labour in connection with the handling of imported coal has undergone a change for the better, and we now hear of few instances where any trouble is experienced with unloading and transport. It is a striking fact that after nine weeks of stoppage there are probably no public undertakings, some of the railways excepted, which now have any reserves of home-produced coal, so that those of us who go through our daily routine with little or no inconvenience are apt to overlook the fact that we are not so dependent for the comforts of life as we had always supposed upon the most valuable natural gift which we possess.

The wholesale introduction of Continental coal has been a useful object lesson, for it has made the large consumer appreciate that in the matter of quality the English variety is beyond comparison. Perhaps the most useful experience has been that of the gasworks, whose operations are certainly a specialised branch of chemical engineering. The majority of the larger undertakings have been enabled to maintain a full supply with the aid of imported coal, mainly from fairly accessible ports such as Calais and Dunkirk; but from all directions we hear complaints of the manner in which the normal smooth operation has been dislocated. As a matter of fact, it has been suggested that from the commercial standpoint the gas undertakings would be far better off if they discontinued the supply and shut down, rather than attempt to make both ends meet under prevailing circumstances. In the first place, ordinary Durham coal was costing, alongside London, about 46s. per ton when it could be obtained, and a ton yielded about 70 therms as gas. On the other hand, Continental coal is costing about 63s. at London, while a ton of it yields no more than 50 therms. The question of by-products apart, therefore, the cost of producing a therm is, for raw material, just about double as much with imported coal as with the normal English variety. Again, as a coking material, the normal Durham coals are unrivalled, and they yield an excellent product for utilisation in gas-producers. The foreign coal, however, contains about 25 per cent. of ash (which means that the coke contains one-third of its weight of ash) and gives rise to untold trouble in the way of clinker formation.

Coal from other countries has also been arriving, notably from America, and we know of one gas undertaking which is preparing to import several thousand tons of this type. German coal, too, is being extensively offered, but from the information which reaches us the prices asked would not appear to be particularly alluring. For instance, the well-known Saar variety is being offered, including freight to London, at just under £5 per ton. On this basis the gross cost of gas, for raw materials alone, would work out at about 10s. per 1,000 cubic feet, against about 4s. with English coal.

Merchants as Exhibitors

THE Committee recently appointed by the Board of Trade to consider the best policy to be adopted in future as regards British industries Fairs admit that the greatest divergence of opinion arose on the question whether factors and merchants should be eligible as exhibitors. After very carefully balancing the arguments for and against, the Committee holds that the Fair should continue in the main to be restricted, as hitherto, to *bona fide* manufacturers and to wholesale firms taking the whole output of a factory or holding the sole selling rights of patented or proprietary

articles manufactured in the British Empire. They frankly recognise, however, certain points in favour of the merchant. First of all, they regard factors and merchants as an important part of this country's organisation for export trade, and admit that it might not unfairly be urged that the Fair is not complete without them.

"The merchant, generally speaking," they state, "has facilities for conducting export business which the manufacturer has not, and buyers will consequently find their requirements more fully and more adequately met by dealing with the merchant. This is particularly applicable in the case of a buyer who wants an assorted parcel of goods, the quantity required for each manufacturer being too small for the latter to be willing to supply direct to the buyer." To the objection that factors and merchants are admitted to the Leipzig and Lyons Fairs, the committee offer the practical answer that here we have no available space —which almost invites the retort that our organisation may be at fault and in need of amendment. Further suggestions are that the needs of merchants might be met by the provision of offices and inquiry rooms at the Fair, and that, while the spring Fair remains restricted to manufacturers, an autumn Fair might be organised for merchants. As regards future Fairs, opinion seems to be strongly in favour of the discontinuance of the Glasgow Fair, and the transference of all the chemical exhibits to London.

The recommendations of the Committee are not, of course, final, and the Board of Trade may yet modify them. In the face of the evidence, however, the Board is hardly likely to insist on the admission of merchants, at least for the present. One reason is the opposition of the large manufacturing associations, whose powerful organisations have given them considerable influence with Government departments. We are not at all sure that this attitude on the part of manufacturers is in the long run as likely to benefit themselves as may appear at first sight. Efficient and widespread distribution is only second in importance to efficient and economical manufacture, and, if the extension of British trade throughout the world is the supreme object of all sections, co-operation would seem to be the more promising policy. Here, by the judicious influences which they are often able to exercise, Government Departments may do something to promote a better understanding by correcting the mistaken view of the manufacturers that merchants are merely parasites, and on the other hand, by inducing merchants to appreciate the British manufacturer's view of foreign competition and to work first for the promotion of British trade. In any case British industry is more likely to benefit from a concert than from a conflict of the manufacturing and the merchanting interests.

Industrial Disease

SIR KENNETH GOADBY'S paper before the Royal Society of Arts this week on the subject of industrial disease deserves to be studied by all concerned in works where those employed are liable to industrial poisoning. As he stated, the exciting causes of most occupational diseases are known, but the individual factor of immunity and susceptibility has received scant attention. Recent research, however, has thrown considerable light on the problem, and concurrently with the improvement of occupational conditions we are making some advance in the more scientific treatment of the individual. Sir Kenneth Goadby's survey of industrial disease—admittedly not exhaustive, but highly suggestive—indicates clearly the existence of individual susceptibility and immunity as factors determining much of the special disease in dangerous trades, and suggests certain general blood tests, whereby susceptible persons can be eliminated from an occupation inimical to their well-being. The blood tests he referred to are simple and easy to carry out, while the estimation of blood pressure is an ordinary routine of medical practice and presents no difficulties. A selection of workers for especially dangerous processes following the general indications he outlined—*e.g.*, alterations in their blood pressure and the white cells of the blood after a short exposure to the dangerous trade influences—might not only reduce the incidence of industrial poisoning in many occupations, but even render safe some trades now regarded as dangerous.

The Calendar

June		
4	The North of England Mining and Mechanical Engineers. 2 p.m.	Newcastle-on-Tyne.
6	Society of Chemical Industry (London Section): "Industrial Respirators," by Dr. Leonard Levy; "The Gold and Silver Thread Industry in India," by Professor K. G. Naik. 8 p.m.	Rooms of the Chemical Society, Burlington House, Piccadilly, London.
9	King's College: "The Development and Present Position of the Theory of Relativity," by Professor Einstein. 5.15 p.m.	King's College, Strand, London.
9	Institute of Chemistry	Liverpool.
10	Royal College of Science Union: Chemical Society: "The Measurement of Air Pollution," by G. M. Watson.	South Kensington, London.
16	Chemical Society: "The Natural Photo-synthetic Processes on Land and in Sea and Air and their Relation to the Origin and Preservation of Life upon the Earth," by Professor B. Moore. 8 p.m.	Institution of Mechanical Engineers, Storey's Gate, London.
17	Royal Institution of Great Britain: "Chemical Combination and the Structure of the Molecule," by Sir J. J. Thomson.	Albemarle Street, Piccadilly, London.
20–24	Annual Chemists' Exhibition ...	Central Hall, Westminster, London.

Books Received

"Factory Chemistry." By Wm. H. Hawkes. London: Longmans, Green & Co. Pp. 59. 4s. 6d. net.

"The Case-hardening of Steel." By Harry Brearley. Second edition. London: Longmans, Green & Co. Pp. 207. 16s. net.

"The Petroleum Year Book, 1921." Founded and edited by Sydney H. North. London: St. James's Press, Ltd. Pp. 252. 10s. 6d. net.

"The Chemical Effects of Alpha Particles and Electrons." By Samuel C. Lind. New York: The Chemical Catalog Co., Inc. Pp. 182.

"The Activated Sludge Process of Sewage Treatment." By J. Edward Porter. General Filtration Co., Inc., Rochester, N.Y. Pp. 117. $1.00.

Colloidal Clay and the Hydrolysis of Oils and Fats—(II)

By Frank E. Weston, B.Sc., F.I.C.

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The first portion of Mr. Weston's article, which appeared last week, dealt mainly with the general principles of the subject. Below he gives a detailed summary of the results of his tests with various oils, and concludes by definitely stating that whatever the action of the clay may be, when utilised in soap manufacture, it certainly does not merely play the part of a "filler."

Preliminary Experiments

THE following results were obtained with a few commercial samples of oils in experiments to ascertain whether colloidal clay had any effect on the hydrolysis of the same when using caustic soda as the catalyst—that is, in the ordinary saponification of oils and fats as practised in soap making.

The method of experimenting was as follows: A known weight of oil, contained in a conical flask, was mixed with a known amount of caustic soda solution, the latter being, in the early experiments, greatly in excess of that required to neutralise the acids produced by complete hydrolysis—the solution was 2·16 N.NaOH, that is, 86·4 grams of Na OH per 1,000 c.c of solution; a known amount of colloidal clay was added and the flask then heated for a known time on a steam bath; all flasks in parallel experiments were heated at the same time and treated exactly alike, being shaken at regular intervals. At the end of the period of heating the contents of the flask were diluted with a known volume of distilled water, and the excess of caustic soda determined by titration with $N.H_2SO_4$, using phenolphthalein as indicator; the difference between the amount of caustic soda added and that found by titration gives the amount of caustic soda used in the hydrolysis. The saponification value of the oil having been determined the percentage of hydrolysis can be calculated.

1.—*Cotton-seed. S.V.*—189·8.

	Weight of oil.	Weight of clay.	Weight of NaOH required for complete hydrolysis.	Weight of NaOH added.	Weight of NaOH used in hydrolysis.	Time of heating.	Per cent. of saponification.
	Grams	Grams	Grams	Grams	Grams	Hrs.	
1	5·00	0·0	0·678	1·728	0·064	0·33	9·4
	5·00	1·0	0·678	1·728	0·142	0·33	20·9
2	5·00	0·0	0·678	1·728	0·042	1·00	6·1
	5·00	1·0	0·678	1·728	0·288	1·00	42·4

2.—*Cotton Seed Oil. S.V.*—195.

3	9·00	0·0	1·252	1·728	0·096	1·00	7·6
	9·00	1·0	1·252	1·728	0·801	1·00	63·9
4	9·00	0·0	1·252	1·728	0·140	1·50	11·1
	9·00	1·0	1·252	1·728	1·036	1·50	82·5
5	9·00	0·0	1·252	1·728	0·282	2·00	22·5
	9·00	1·0	1·252	1·728	1·216	2·00	97·1

3.—*Linseed Oil. S.V.*—190.

6	5·87	0·0	0·796	1·728	0·316	1·00	39·6
	4·25	1·0	0·575	1·728	0·560	1·00	97·3

4.—*Olive Oil. S.V.*—190.

7	5·854	0·0	0·794	1·728	0·180	1·25	22·6
	5·485	0·5	0·794	1·728	0·396	1·25	53·2
8	5·640	0·0	0·766	1·728	0·168	1·25	21·9
	5·390	1·0	0·734	1·728	0·382	1·25	52·0

5.—*Cocoa-Nut Oil. S.V.*—270.

9	7·00	0·0	1·35	1·728	0·392	1·00	29·0
	7·00	0·1	1·35	1·728	0·720	1·00	54·0
	7·00	0·5	1·35	1·728	1·200	1·00	88·0
	7·00	1·0	1·35	1·728	1·228	1·00	90·9
	7·00	1·5	1·35	1·728	1·340	1·00	99·2

The foregoing results indicate very clearly that colloidal clay has a marked effect upon the hydrolysis of the oils examined; it moreover indicated that the effect is more pronounced in the case of some than the others and that within certain limits the amount of colloidal clay required to obtain the optimum hydrolysis is about 20 per cent. of the weight of oil taken.

It will be noted that in all the foregoing experiments a considerable excess of caustic soda was used; hence a few experiments were carried out in which a much smaller excess of caustic soda was used, and at the same time two experiments in which only 50 per cent. of the theoretical quantity required to neutralise the acids on complete hydrolysis was added.

6.—*Cotton-Seed Oil. S.V.*—195.

	Weight of oil.	Weight of clay.	Weight of NaOH required for complete hydrolysis.	Weight of NaOH added.	Weight of NaOH used in hydrolysis.	Time of heating.	Per cent. of saponification.
	Grams	Grams	Grams	Grams	Grams	Hrs.	
10	10·00	0·0	1·392	1·500	0·064	1·00	4·6
	10·00	1·0	1·392	1·500	0·462	1·00	30·3
11	10·00	0·0	1·392	1·500	0·280	2·00	20·1
	10·00	1·0	1·392	1·500	1·252	2·00	90·1
12	10·00	2·0	1·392	0·696	0·596	1·00	42·8*
	10·00	2·0	1·392	0·696	0·696	2·00	50·0*

* Out of 50.

In order to ascertain in experiment 12 whether 50 per cent. of the oil was left unsaponified attempts were made to separate the unsaponified oil by extraction with solvents; it was found impossible to do so as thick emulsions were formed with either ether or petroleum ether from which only a very small amount of water separated even on standing for ten days. Further investigations showed that the unsaponified oil could be extracted by mixing about 10 grams of purified white sand with the saponified mixture, evaporating to dryness on a water-bath, drying in a steam oven and then extracting the mass with dry ether in a Soxhlet apparatus in the usual way. Using the same sample of cotton seed oil as 6, and heating for one hour with 2 grams of clay the following results were obtained:—

	Weight of oil taken.	Weight of oil recovered.	Per cent. of saponification by titration.	Per cent. of saponification from weight of recovered oil.
13	5·00 grams	2·67 grams	47·0	46·6
14	do.	2·70 „	45·0	44·6

Rate of Saponification

Having shewn that colloidal clay greatly facilitates the hydrolysis of oils in the ordinary process of saponification it was thought advisable to attempt to follow the course of the reaction. For this purpose parallel series of experiments were carried out, the same quantity of oil was weighed into a number of similar flasks, the same weight of caustic soda—as solution—was added to each, and to half of the flasks was added the same weight of colloidal

clay, whilst the remaining half of the flasks contained no clay; the flasks were then placed on a steam-bath and heated under the same conditions for stated times, all flasks being shaken alike at definite intervals—usually every five minutes. At the end of the period of heating one flask of each series was removed, treated with distilled water and titrated with standard acid, &c., &c.

SERIES I.—2·0025 *N. NaOH was Used in Excess* (8·01 *grams NaOH per* 100 *c.c.*)

1.—*Cotton-Seed Oil. S.V.*—190·2.

	Weight of oil.	Weight of clay.	Weight of NaOH required for complete hydrolysis.	Weight of NaOH added.	Weight of NaOH used in hydrolysis.	Time of heating.	Per cent. of saponification.
	Grams	Grams	Grams	Grams	Grams	Hrs.	
15	10·0	1·0	1·356	1·898	0·342	0·75	25·2
	10·0	1·0	1·356	1·898	0·794	1·50	58·0
	10·0	1·0	1·356	1·898	1·318	3·00	97·1
	10·0	1·0	1·356	1·898	1·356	3·75	100·0
	10·0	0·0	1·356	1·898	0·042	0·75	3·0
	10·0	0·0	1·356	1·898	0·138	1·50	10·1
	10·0	0·0	1·356	1·898	0·430	3·00	31·6
	10·0	0·0	1·356	1·898	0·802	3·75	59·0

2.—*Linseed Oil. S.V.*—186.

16	10·0	1·0	1·328	1·858	0·576	0·5	43·3
	10·0	1·0	1·328	1·858	0·800	1·0	60·2
	10·0	1·0	1·328	1·858	1·328	1·5	100·0
	10·0	0·0	1·328	1·858	0·378	0·5	28·4
	10·0	0·0	1·328	1·858	0·680	1·0	51·2
	10·0	0·0	1·328	1·858	0·800	1·5	60·2
	10·0	0·0	1·328	1·858	1·328	2·0	100·0

3.—*Soya-bean Oil. S.V.*—189·7.

17	10·0	1·0	1·3556	1·8988	0·346	0·75	25·6
	10·0	1·0	1·3556	1·8988	0·734	1·50	54·1
	10·0	1·0	1·3556	1·8988	0·930	2·25	68·6
	10·0	1·0	1·3556	1·8988	1·3555	3·00	100·0
	10·0	0·0	1·3556	1·8988	0·238	0·75	17·5
	10·0	0·0	1·3556	1·8988	0·618	1·50	45·6
	10·0	0·0	1·3556	1·8988	0·802	2·25	59·1
	10·0	0·0	1·3556	1·8988	1·234	3·00	91·0
	10·0	0·0	1·3556	1·8988	1·287	3·75	95·0
	10·0	0·0	1·3556	1·8988	1·328	4·00	98·0

4.—*Palm Oil. S.V.*—200 *A.V.*—23 *per cent. as oleic acid.*

18	10·0	1·0	1·427	1·1416	0·592	0·25	41·4
	10·0	1·0	1·427	1·1416	0·804	0·50	56·3
	10·0	1·0	1·427	1·1416	1·036	0·75	72·6
	10·0	1·0	1·427	1·1416	1·172	1·00	82·1
	10·0	1·0	1·427	1·1416	1·218	1·25	85·3
	10·0	1·0	1·427	1·1416	1·340	1·50	93·9
	10·0	0·0	1·427	1·1416	0·590	0·25	41·3
	10·0	0·0	1·427	1·1416	0·768	0·50	53·8
	10·0	0·0	1·427	1·1416	1·022	0·75	71·6
	10·0	0·0	1·427	1·1416	1·084	1·00	75·9
	10·0	0·0	1·427	1·1416	1·160	1·25	78·2
	10·0	0·0	1·427	1·1416	1·220	1·50	85·4

5.—*Soya-Bean Oil. S.V.*—190·4.

19	5·0	1·0	0·680	0·680	0·228	0·75	33·5
	5·0	1·0	0·680	0·680	0·512	1·50	75·3
	5·0	1·0	0·680	0·680	0·642	2·25	94·4
	5·0	1·0	0·680	0·680	0·653	3·00	97·9
	5·0	0·0	0·680	0·680	0·227	0·75	33·4
	5·0	0·0	0·680	0·680	0·440	1·50	64·7
	5·0	0·0	0·680	0·680	0·570	2·25	83·8
	5·0	0·0	0·680	0·680	0·600	3·00	88·2

SERIES II.—*N. NaOH was used* (4 *grams NaOH per* 100 *c.c.*).

1.—*Whale Oil. S.V.*—193 *A.V.*—0·45 *per cent. oleic acid.*

20	10·0	1·0	1·378	1·1380	0·174	0·5	12·6
	10·0	1·0	1·378	1·1380	0·358	1·0	25·9
	10·0	1·0	1·378	1·1380	0·510	1·5	37·0
	10·0	1·0	1·378	1·1380	0·774	2·25	57·1
	10·0	1·0	1·378	1·1380	1·000	3·00	72·6
	10·0	1·0	1·378	1·1380	1·034	3·75	75·0
	10·0	0·0	1·378	1·1380	0·174	0·5	12·6
	10·0	0·0	1·378	1·1380	0·342	1·0	24·8
	10·0	0·0	1·378	1·1380	0·438	1·5	31·7
	10·0	0·0	1·378	1·1380	0·654	2·25	47·4
	10·0	0·0	1·378	1·1380	0·854	3·00	61·9
	10·0	0·0	1·378	1·1380	0·942	4·00	68·3

2.—*Japan Fish Oil. S.V.*—189·7 *A.V.*—0·44 *per cent. oleic acid.*

	Weight of oil.	Weight of clay.	Weight of NaOH required for complete hydrolysis.	Weight of NaOH added.	Weight of NaOH used in hydrolysis.	Time of heating.	Per cent. of saponification.
	Grams	Grams	Grams	Grams	Grams	Hrs.	
21	10·0	1·0	1·3548	1·356	0·3268	0·5	26·7
	10·0	1·0	1·3548	1·356	1·5148	1·0	38·0
	10·0	1·0	1·3548	1·356	0·7408	1·5	54·6
	10·0	1·0	1·3548	1·356	0·9068	2·25	66·9
	10·0	1·0	1·3548	1·356	0·9708	3·00	71·6
	10·0	1·0	1·3548	1·356	1·1228	3·75	82·8
	10·0	0·0	1·3548	1·356	0·2348	0·5	17·3
	10·0	0·0	1·3548	1·356	0·4268	1·0	31·5
	10·0	0·0	1·3548	1·356	0·5628	1·5	41·5
	10·0	0·0	1·3548	1·356	0·6548	2·25	48·3
	10·0	0·0	1·3548	1·356	0·7868	3·00	58·0
	10·0	0·0	1·3548	1·356	0·8028	3·75	59·2

3.—*Linseed Oil. S.V.*—186.

22	10·0	1·0	1·328	1·328	0·256	0·5	19·2
	10·0	1·0	1·328	1·328	0·568	1·0	42·7
	10·0	1·0	1·328	1·328	0·936	1·5	70·4
	10·0	1·0	1·328	1·328	1·120	2·0	84·2
	10·0	0·0	1·328	1·328	0·252	0·5	18·8
	10·0	0·0	1·328	1·328	0·256	1·0	19·2
	10·0	0·0	1·328	1·328	0·420	1·5	31·6
	10·0	0·0	1·328	1·328	0·572	2·0	43·0

4.—*Rape Seed Oil. S.V.*—181 *A.V.*—0·48 *per cent. oleic acid.*

23	10·0	1·0	1·292	1·292	0·288	0·5	22·4
	10·0	1·0	1·292	1·292	0·336	1·0	26·0
	10·0	1·0	1·292	1·292	0·342	1·5	26·4
	10·0	1·0	1·292	1·292	0·440	2·25	34·0
	10·0	1·0	1·292	1·292	0·500	3·00	38·7
	10·0	1·0	1·292	1·292	0·778	3·75	60·2
	10·0	0·0	1·292	1·292	0·174	0·5	13·4
	10·0	0·0	1·292	1·292	0·232	1·0	17·9
	10·0	0·0	1·292	1·292	0·300	1·5	23·2
	10·0	0·0	1·292	1·292	0·364	2·25	28·1
	10·0	0·0	1·292	1·292	0·444	3·00	34·3
	10·0	0·0	1·292	1·292	0·528	3·75	40·8

5.—*Olive Oil. S.V.*—192.

24	10·0	1·0	1·372	1·372	0·088	0·5	6·4
	10·0	1·0	1·372	1·372	0·168	1·0	12·2
	10·0	1·0	1·372	1·372	0·272	1·5	19·8
	10·0	1·0	1·372	1·372	0·352	2·0	25·6
	10·0	1·0	1·372	1·372	0·552	2·5	40·2
	10·0	1·0	1·372	1·372	0·844	3·0	61·4
	10·0	1·0	1·372	1·372	0·996	3·5	72·5
	10·0	1·0	1·372	1·372	1·356	4·0	98·7
	10·0	0·0	1·372	1·372	0·028	0·5	2·0
	10·0	0·0	1·372	1·372	0·088	1·0	4·9
	10·0	0·0	1·372	1·372	0·104	1·5	7·5
	10·0	0·0	1·372	1·372	0·164	2·0	11·9
	10·0	0·0	1·372	1·372	0·228	2·5	16·6
	10·0	0·0	1·372	1·372	0·276	3·0	20·1
	10·0	0·0	1·372	1·372	0·560	3·5	40·8
	10·0	0·0	1·372	1·372	0·764	4·0	55·6

6.—*Arachis Oil (Ground Nut Oil). S.V.*—192.

25	10·0	1·0	1·372	1·372	0·108	0·5	7·8
	10·0	1·0	1·372	1·372	0·220	1·0	16·0
	10·0	1·0	1·372	1·372	0·516	1·5	37·6
	10·0	1·0	1·372	1·372	0·724	2·0	52·7
	10·0	1·0	1·372	1·372	0·823	2·5	60·0
	10·0	1·0	1·372	1·372	0·892	3·0	65·0
	10·0	0·0	1·372	1·372	0·028	0·5	2·0
	10·0	0·0	1·372	1·372	0·052	1·0	3·8
	10·0	0·0	1·372	1·372	0·092	1·5	6·7
	10·0	0·0	1·372	1·372	0·180	2·0	13·1
	10·0	0·0	1·372	1·372	0·240	2·5	17·4
	10·0	0·0	1·372	1·372	0·340	3·0	24·7

7.—*Tung Oil. S.V.*—190·4.

26	10·0	1·0	1·36	1·348	0·112	0·5	8·3
	10·0	1·0	1·36	1·348	0·476	1·0	35·3
	10·0	1·0	1·36	1·348	0·880	1·5	65·2
	10·0	1·0	1·36	1·348	1·200	2·0	89·2
	10·0	1·0	1·36	1·348	1·280	2·5	94·9
	10·0	1·0	1·36	1·348	1·332	3·0	98·8
	10·0	0·0	1·36	1·348	0·100	0·5	7·4
	10·0	0·0	1·36	1·348	0·168	1·0	12·4
	10·0	0·0	1·36	1·348	0·472	1·5	35·0
	10·0	0·0	1·36	1·348	0·860	2·0	63·7
	10·0	0·0	1·36	1·348	1·184	2·5	87·8
	10·0	0·0	1·36	1·348	1·252	3·0	92·8

8.—*Tung Oil.* *S.V.*—190·4.

(In this experiment the Caustic Soda was diluted down to 2 grams per 100 c.c.)

	Weight of oil.	Weight of clay.	Weight of NaOH required for complete hydrolysis.	Weight of NaOH added.	Weight of NaOH used in hydrolysis.	Time of heating.	Per cent. of saponification.
	Grams	Grams	Grams	Grams	Grams	Hrs.	
27	10·0	1·0	1·36	1·31	0·054	0·5	3·9
	10·0	1·0	1·36	1·31	0·110	1·0	8·0
	10·0	1·0	1·36	1·31	0·198	1·5	14·6
	10·0	1·0	1·36	1·31	0·262	2·0	19·2
	10·0	1·0	1·36	1·31	0·418	2·5	30·7
	10·0	1·0	1·36	1·31	0·520	3·0	38·2
	10·0	0·0	1·36	1·31	0·050	0·5	3·6
	10·0	0·0	1·36	1·31	0·086	1·0	6·3
	10·0	0·0	1·36	1·31	0·166	1·5	12·2
	10·0	0·0	1·36	1·31	0·182	2·0	13·3
	10·0	0·0	1·36	1·31	0·224	2·5	16·4
	10·0	0·0	1·36	1·31	0·286	3·0	20·5

Effect of Colloidal Clay

From the foregoing results it is evident that all the oils examined are more easily hydrolysed in the presence of colloidal clay than without, all other conditions being equal; the degree of hydrolysis varies considerably with the different oils, it being observed that those most easily hydrolysed readily formed emulsions with the colloidal clay used. On plotting curves shewing the relation between the amount of hydrolysis and the time taken it will be found that after a certain amount of hydrolysis has taken place the rate of hydrolysis begins to increase; this increase was observed to be synchronous with the formation of more or less perfect emulsion. The stability of these emulsions depends, however, upon many factors and since the concentration of the caustic soda and oil is gradually diminishing as the hydrolysis proceeds, whilst that of the soap increases, it will be noted that if at a certain concentration of all these bodies the best emulsion is formed, then for concentration below and above this optimum the stability of the emulsion falls off, *i.e.*, after a certain point has been reached the rate of hydrolysis will fall off. The curves show, in many cases, a falling off in the rate after 70 to 80 per cent. of hydrolysis has taken place, whilst in others the rate gradually increases and complete hydrolysis is attained.

Experiments on Emulsification

As was previously stated, colloidal clay has the power of producing emulsions with oil and water and a few experiments are here detailed to illustrate the progress of the emulsification. The method of operating was as follows: Into a flat-bottomed, graduated specimen tube (10×2·5 cms.) a known weight of oil and colloidal clay was placed, a known weight of water is then added, the tube closed with a cork and well shaken, first in a shaking machine and then by hand; the tube was then allowed to stand 24 hours in order that equilibrium could be attained and then the volumes of emulsion were read off; more water was then added and the operations were repeated, &c., &c. In all cases examined emulsions were instantly produced which were of a permanent character; moreover it was found that there is a limiting value to the quantities of oil and water that produce permanent emulsions. This limiting value is the same as far as examined—whether the water is added to the oil or, *vice versa*, the oil added to the water and clay. Under certain conditions the emulsion is one of oil in water whilst under other conditions the emulsion is one of water in oil. These conditions are being further investigated. The following results are illustrative of the general behaviour of oils and water in the presence of colloidal clay:—

Linseed Oil.

10 c.c. of oil taken and 1·0 gram of colloidal clay added.

Volume of Water Added.	Time of Standing.	Volumes of resulting Liquids. Top Layer.	Bottom Layer.
1 c.c.	24 hours	5 c.c. oil	6 c.c. emulsion
2 ,,	,,	5 c.c. ,,	7 c.c. ,,
3 ,,	,,	6 c.c. ,,	7 c.c. ,,
4 ,,	,,	5 c.c. ,,	8 c.c. ,,
5 ,,	,,	3 c.c. ,,	11 c.c. ,,
6 ,,	,,	2 c.c. ,,	12 c.c. ,,
7 ,,	,,	1 c.c. ,,	14 c.c. ,,
8 ,,	,,	1·25 c.c. ,,	14·25 c.c. ,,
9 ,,	,,	1 c.c. ,,	15 c.c. ,,
10 ,,	,,	0·5 c.c. ,,	16·5 c.c. ,,
11 ,,	,,	0·5 c.c. ,,	17 c.c. ,,
12 ,,	,,	0·5 c.c. ,,	18 c.c. ,,
13 ,,	,,	1 c.c. ,,	19 c.c. ,,
14 ,,	6 months	2·0 c.c. ,,	20 c.c. ,,

Bean Oil.

1 c.c.	24 hours	6 c.c. oil	3·5 c.c. emulsion
2 ,,	,,	6 c.c. ,,	4·5 c.c. ,,
3 ,,	,,	6 c.c. ,,	6·0 c.c. ,,
4 ,,	,,	6 c.c. ,,	7·0 c.c. ,,
5 ,,	,,	5 c.c. ,,	8·5 c.c. ,,
6 ,,	,,	4 c.c. ,,	10·0 c.c. ,,
7 ,,	,,	4 c.c. ,,	11·0 c.c. ,,
8 ,,	,,	4 c.c. ,,	12·0 c.c. ,,
9 ,,	,,	3 c.c. ,,	14·0 c.c. ,,
10 ,,	,,	2 c.c. ,,	16·0 c.c. ,,
11 ,,	,,	1 c.c. ,,	17·0 c.c. ,,
12 ,,	,,	1 c.c. ,,	18·0 c.c. ,,
13 ,,	,,	0·5 c.c. ,,	19·0 c.c. ,,
14 ,,	6 months	2·0 c.c. ,,	21·0 c.c. ,,

Cotton Seed Oil.

10 c.c. of oil taken and 1·0 gram of colloidal clay added.

Volume of Water Added.	Time of Standing.	Volume of resulting Liquids. Top Layer.	Bottom Layer.
1 c.c.	24 hours	6 c.c. oil	4 c.c. emulsion
2 ,,	,,	5 c.c. ,,	7 c.c. ,,
3 ,,	,,	5 c.c. ,,	8 c.c. ,,
4 ,,	,,	5 c.c. ,,	9 c.c. ,,
5 ,,	,,	5 c.c. ,,	10 c.c. ,,
6 ,,	,,	5 c.c. ,,	11 c.c. ,,
7 ,,	,,	4 c.c. ,,	13 c.c. ,,
8 ,,	,,	3·5 c.c. ,,	13·5 c.c. ,,
9 ,,	,,	3·0 c.c. ,,	15 c.c. ,,
10 ,,	,,	3·0 c.c. ,,	16 c.c. ,,
11 ,,	,,	14·0 c.c. emulsion	5 c.c. water and clay
12 ,,	,,	drop of oil 15 c.c. emulsion	5 c.c. water and clay
12 ,,	6 months	drop of oil 13 c.c. emulsion	8 c.c. water and clay

Cotton Seed Oil.

10 c.c. of a solution of sodium oleate containing 0·1 gram of sodium oleate, 1·0 gram of colloidal clay.

Volume of Oil Added.	Time of Standing.	Volume of resulting Liquids. Top Layer.	Bottom Layer.
1·0 c.c.	24 hours	1·5 c.c. emlsn.	10 c.c. water clay emulsion and deposit of clay
2·0 ,,	,,	2·5 c.c. ,,	10 c.c. waterclay emulsion
6·0 ,, & 1 c.c. water	,,	6·0 c.c. ,, (frothy)	10 c.c. ,, ,,
6·0 ,, & 4 c.c. water	,,	6·0 c.c. ,,	11 c.c. ,, ,,
7·0 ,,	,,	9·0 c.c. ,,	9·5 c.c. ,, ,,
8·0 ,,	,,	12·0 c.c. ,,	9·5 c.c. ,, ,,
9·0 ,,	,,	16·0 c.c. ,,	8·0 c.c. ,, ,,
9·0 ,,	6 months	(1 c.c. oil, 15·0 c.c.)	9·0 c.c. ,, ,,

The foregoing results are only a few of many to illustrate the emulsifying action of colloidal clay; the emulsions in all cases, in the final stage, are of a very thick cream-like nature. The phenomenon is still under investigation. The increase in the rate of hydrolysis of oils in the presence of colloidal clay appears to be closely related to the degree of emulsification produced between the oil and the solution

of caustic soda. The results so far obtained open up a wide field in their technical applications.

Technical Applications

In a previous article on colloidal clay soap* it was shown that colloidal clay when incorporated into soap already made produced a homogeneous mixture or soap better than the original soap without clay; this is shown by the following criteria:—

1. The greater lowering of the surface tension of its solution against air than the solution of the original soap with which the clay is incorporated.
2. The increased lathering properties.
3. The greater adsorptive power.
4. The greater detergent power due to the powerful emulsifying action it possesses.

The present investigation shows that it is possible to make a colloidal clay soap directly from either (1) an oil or fat or (2) a mixture of fatty acids, the soap produced having similar properties to that made by incorporating the colloidal clay after the soap has been made. The value of the direct method of preparing a colloidal clay soap lies in the time required for saponification being greatly curtailed with consequent saving in cost of manufacture both as regards fuel and labour.

Moreover, the colloidal clay soap thus produced either directly or indirectly possesses the following advantages over ordinary soap:—

1. It is more soluble in water and produces a lather quicker.
2. It is ready for use sooner after manufacture than ordinary soap and dries quickly, and yet it does not become too dry by long keeping.
3. It is less likely to contain free fatty acids or free alkali; owing to the increase in the velocity of saponification and to the more complete saponification the quantities of reacting material can be more easily adjusted and any slight excess of alkali is counteracted by the adsorptive power of the colloidal clay.
4. It improves greatly in quality on ageing, whereas soap alone generally deteriorates after eighteen months or so.

Conclusion

In conclusion, from whatever point of view one studies the action of colloidal clay in soap, whether it be the effect it has on the surface tension of soap solutions, its adsorptive power and the part it plays in the formation of oil and water emulsions, or its effect on the hydrolysis of oils and fats it certainly cannot be maintained that colloidal clay is only playing the part of a "filler"—it is more in harmony with experimental fact to term it "an active principle"; whether its action is partly or wholly colloidal, catalytic or chemical, the results leave no room for doubt.

Moreover, since the properties of solutions affected by colloidal clay are some of the factors which play a most important part in many empirical technical operations of the present day, the future applications of this remarkable substance may well be left to the imagination.

[NOTE.—The colloidal clay referred to in the above article is that patented by Messrs. Catalpo, Ltd., and the author is indebted to the firm for permission to publish the above results.]

In the City of London there are 49 places registered for the STORAGE AND SALE OF EXPLOSIVES. Ten were new registrations during the past year. There are 54 licences in the City under the Petroleum Acts, 1871 and 1879, 44 for petroleum, six for carbide of calcium, and four for carbide of calcium and petroleum. Nine new licences were granted during 1920.

* *Chem. Age.*, Vol. II., 31st Jan., 1920.

Scientific Glassware

To the Editor of THE CHEMICAL AGE

SIR,—I have very carefully read the speech of Mr. Lyle Samuel, M.P., in the House of Commons on the "Safeguarding of Industries Bill" relative to the manufacture of scientific glassware, which I find is full of misleading statements. He states "That there are only three firms in this country, despite nearly seven years' advantage of practical protection, who have attempted to produce these things in any serious quantity, and only one firm—and that a firm in Yorkshire—is entering into serious competition in the production of these things. . . . There is only one firm engaged in chemical glassware manufacture in this country to any extent and more unfortunate still it is that nearly all the workmen engaged, and certainly all the efficient workmen, are foreigners. . . . There are only three firms who have attempted to do it, and only one is doing it in a serious manner, and even the goods of that firm are inferior to the goods which are produced in Germany."

The employees of both departments (furnace workers and lampblown workers) of the chemical glassware section of Messrs. Wood Bros.' Glass Co., Ltd., Barnsley, the Yorkshire firm implied, desire me to protest most emphatically against the un-British and unfounded attitude of Mr. Lyle Samuel anent their abilities as British workers, many of whom served in the war and were disabled. Further, it has been proved by the highest tests that the quality and finish of this firm's goods are equal, and in many cases superior, to goods produced by the foreigner.

With reference to the statement that the efficient workmen employed by this firm are foreigners, on my own as a British workman (Scotsman) I issue the following challenge to Mr. Lyle Samuel, M.P.:—

"That in the event of Mr. Lyle Samuel being able to prove this statement as correct, I will give £50 to the St. Dunstan Hospital for the Blind, and if he cannot prove the same that he make a public apology to this effect, and that he be allowed seven clear days in which he can refute his mis-statement."

I have obtained from the managing director an invitation to Mr. Samuel to visit the works and see for himself the methods and class of goods produced, also the employees' list, so that in his next attempt he will have some *real* data to guide him.—Yours, &c., (Signed) JAMES HENDERSON.

Shop Manager, No. 5 Furnace, Chemical Ware Section,
June 1. Wood Bros., Ltd., Barnsley.

Presentation to Dr. F. B. Power

AN interesting Anglo-American function took place in the Assembly Hall of the Cosmos Club, Washington, U.S.A., on May 9th, when Mr. Henry S. Wellcome, well known for his generous promotion of scientific research, presented Dr. F. B. Power with a gold medal specially struck to commemorate Dr. Power's distinguished services to science during 18½ years as Director of the Wellcome Chemical Research Laboratories, London. Dr. Power's researches have been chiefly concerned with the constituents of plants, and more especially those plants used in medicine. During his directorship of the Wellcome Laboratories about 170 papers were contributed to scientific societies, and, as one of the speakers at the presentation said, Dr. Power had during that time the greatest influence both in America and Great Britain in raising the standard of our pharmacopœia. His work is moreover still bearing fruit, and as an instance of this it may be mentioned that the new treatment of leprosy, which gives promise of effecting a complete cure of this terrible disease, is based on the results of a series of researches conducted by Dr. Power in London.

Leading Figures in the Chemical Engineering Group

The Chemical Engineering Group

Annual Meeting and Dinner in London

The annual meeting and dinner of the Chemical Engineering Group of the Society of Chemical Industry were held in London on Tuesday last. In this issue we publish a "Retrospect and Forecast" by a member of the Group, reports of the annual meeting and dinner, including Mr. Reavell's address on "The Future of Chemical Engineering," and a review of the first volume of the Group's "Proceedings," together with specimens of the data sheets now in course of preparation and a photographic group of the leading officials.

Retrospect and Forecast

BY A MEMBER OF THE GROUP.

THE second annual meeting of the Chemical Engineering Group, held in London this week, affords a convenient opportunity of taking stock of the present position of the Group, and reviewing the progress made since the date of its inception. The circumstances leading to its foundation are admirably set out in the introduction to the first volume of "Proceedings" (reviewed in this issue), and the enthusiasm with which the proposal was received can be gauged by the fact that over 500 members had been enrolled before the close of the first year's work. All men of discernment in the chemical and allied industries joined in welcoming the Group as filling a very decided want in the post-war forward movement towards national industrial rehabilitation, and those who were members of the Society of Chemical Industry viewed with satisfaction the constitution of the Group as an offshoot of that Society.

From that time the history of the Group, if one may speak of history in connection with so young an institution, has been one of progressive achievement from the purely educational side, but one of decline from the point of view of membership. When one recalls the conferences arranged by the Group on "Power Plant," "Pumping Machinery," "Labour Saving Devices," culminating in July of last year in the brilliantly successful meetings on "Filtration," it cannot be denied that the Group has more than justified its existence in so far as it has been responsible for the information gathered together under the foregoing heads. It is an open secret that the attendance at the meetings of the last conference of the Group (July, 1920) were more than double those at any other of the scientific gatherings comprising the annual general meeting of the Society of Chemical Industry, and yet the influx of new members resulting therefrom—a notable result after previous Conferences—was small. In short, the value of the Group's work continues to increase, and yet the membership support it receives is rather less than when the movement was first initiated.

Obviously, valuable work of the kind undertaken by the Group cannot be completed without funds. The principal source of income of such an organisation should at all times be subscriptions from its members, preferably as small a subscription as possible from a large number of such members. If, therefore, the membership seriously declines, it becomes important to discover why this happens.

The balance sheet for 1920 shows that the Group includes about 20 per cent. less members than during the first year of its existence, and it is understood that the returns to date indicate a probable repetition of this decrease for 1921. The decrease has occurred in both classes of members—those who join and are already members of the Society of Chemical Industry and those who join the Society in order to join the Group. The stress of circumstances since the beginning of this year and the increase in the Society's subscriptions for 1921 will account for some falling away of members, but the real reason for the decline appears to go deeper than this. Many are definitely of the opinion that the construction of the Group as an integral part of the Society of Chemical Industry has been both a help and a hindrance—a help in its formation and a hindrance to its development. The obligation upon new members to contribute to the Society a sum equal to 3½ times the annual subscription to the Group in order to qualify for membership is a serious obstacle to progress. On the other hand, existing members of the Society urge, apparently with good reason, that all the best of the Group's publications can be obtained through the ordinary channels of their existing membership, and the extra liability of the Group subscription is thus unnecessary expenditure.

Regarding the first part, it is no argument, in my opinion, to say that the privileges of full membership of the Society are of extreme value to all would-be members of the Group, and that the obligation to join the Society is, therefore, no hardship. It would be no loss to the Society and a distinct help to the Group if such membership were optional instead of compulsory, or some intermediate arrangement not involving as heavy an annual subscription as now could be entered into. As far as the second matter is concerned, it should be a question of internal adjustment between the Group and Society officials to remove the grounds for the allegations made, and many are surprised that cause for complaint should ever have arisen.

Turning to the future prospects of the Group, it can be asserted without fear of contradiction that the need for vigorous extension of its work is more and more urgent. Whether such extension is best undertaken with the present arrangement or not is a matter of opinion, but there can be no question that maximum efficiency of plant and process and minimum labour will be essential for the survival, let alone progress, of many industries in this country. The Chemical Engineering Group stands for the spread of such knowledge as will help in this kind of development, and it will be little less than a tragedy if, for any reason at all, and especially on the ground of lack of funds and of members, its activities have to be curtailed.

Second Annual Meeting

THE second annual meeting of the Group was held at the Florence Restaurant, Rupert Street, London, on Tuesday evening. Mr. J. Arthur Reavell presided, and those present included: Professor J. W. Hinchley, Mr. H. Talbot (hon. secretary), Mr. W. Macnab, Mr. C. S. Garland, Captain C. J. Goodwin, Mr. B. Bark, Mr. H. C. Reynard, Mr. F. A. Frost, Mr. E. A. Alliott, Mr. Sutton, Mr. R. C. Campbell, Mr. L. J. de Whalley, Mr. J. J. Ford, Mr. J. H. West, Mr. G. H. de Lacy, Mr. G. W. Riley, Mr. H. J. Pooley, Mr. J. D. Taylor, Mr. A. Whatmore, Mr. B. R. S. Jones, Mr. J. J. Long, Mr. A. C. Flint (assistant secretary).

Finance

The report of the hon. treasurer was presented, in the absence of Mr. F. H. Rogers, by Professor Hinchley. This showed that the revenue of £1,420 was about £500 larger than the corresponding figure of 1919. A deficiency of £163 on the year's working was counterbalanced to the extent of £150 by the reserving of this amount for the second volume of "Proceedings." The deficiency would have been much greater had it not been for the receipt of donations amounting to over £327. The number of members at the close of 1920 was 427, and the cost of carrying on the Group per member was £3 6s. 3d. For the annual subscription of one guinea it was estimated that each member had received a direct return worth 32s. To meet the financial situation for the future it was suggested that the subscription or the membership might be increased, or both.

A letter was read from Mr. Rogers in which he said that during the past year the members had received better value than ever before. Nothing was nearer his heart than to see the Group in an absolutely strong position.

Professor HINCHLEY explained at some length negotiations which had been proceeding between the Group and the Council of the Society, and expressed a hope that the relations for the future would be satisfactory.

On the motion of the CHAIRMAN, seconded by Mr. H. TALBOT, the balance sheet and report were adopted, and a vote of thanks was passed to those who had given donations.

Mr. J. H. WEST inquired what proportion of the income was represented by grants from the parent society, and what income the Society derived from the members who had joined to become members of the Group.

Samples of Data Sheets prepared by the C. E. Group.

PROPERTIES OF SATURATED STEAM.

PRESSURES. Gauge. Inches. Mercury. Vacuum	PRESSURES. Absolute. Lbs. sq. in.	TEMPERATURES. Cent.	TEMPERATURES. Fahr.	LATENT HEAT. per pound. C.P.U.	LATENT HEAT. per pound. B.Th.U.	TOTAL HEAT. per pound. from 0° C. C.P.U.	TOTAL HEAT. per pound. from 32° F. B.Th.U.	VOLUME & WEIGHT. Cubic Feet per pound.	VOLUME & WEIGHT. Pounds per cu. ft.
29.5	.21	12.2	54	588	1059	601	1081	1510	.000662
29	.45	25.0	77	582	1047	607	1093	720	.00139
28.5	.70	32.5	90	578	1039	610	1098	466	.00215
28	.94	37.6	100	575	1034	612	1102	360	.00278
27.5	1.19	42.0	108	572	1030	614	1106	272	.00368
27	1.43	45.8	114	570	1027	616	1109	237	.00422
26	1.92	51.7	125	567	1021	619	1114	179	.00559
25	2.42	56.5	134	564	1016	621	1118	146	.00685
24	2.91	60.3	140	562	1012	623	1121	122	.00820
23	3.40	63.6	146	560	1009	624	1123	105	.00952
22	3.89	66.6	152	559	1006	625	1126	93.0	.0107
21	4.38	69.4	157	557	1003	626	1128	83.0	.0120
20	4.87	71.7	161	556	1000	627	1129	75.3	.0133
19	5.36	74.0	165	554	998	628	1131	68.7	.0145
18	5.85	76.0	169	553	996	629	1133	63.5	.0157
17	6.34	78.1	173	552	994	630	1135	58.7	.0170
16	6.83	80.0	176	551	992	631	1136	54.8	.0182
15	7.32	81.7	179	550	990	632	1137	51.5	.0194
14	7.82	83.3	182	549	988	632	1138	48.5	.0206
13	8.31	84.8	184	548	987	633	1139	45.7	.0219
12	8.80	86.2	187	547	985	633	1140	43.2	.0231
10	9.78	89.0	192	546	983	635	1143	39.1	.0256
8	10.76	91.5	198	544	980	636	1144	35.7	.0280
6	11.74	93.7	201	543	977	637	1146	33.0	.0303
4	12.72	96.1	205	542	975	638	1148	30.6	.0327
2	13.71	98.0	208	540	973	638	1149	28.5	.0351
0	**14.69**	**100**	**212**	**539.3**	**971**	**639**	**1151**	**26.8**	**.0373**

Heat Units :—C.P.U.=Degree-Centigrade-Pound Unit=1.8 B. Th. U.
=0.454 kg. calorie.

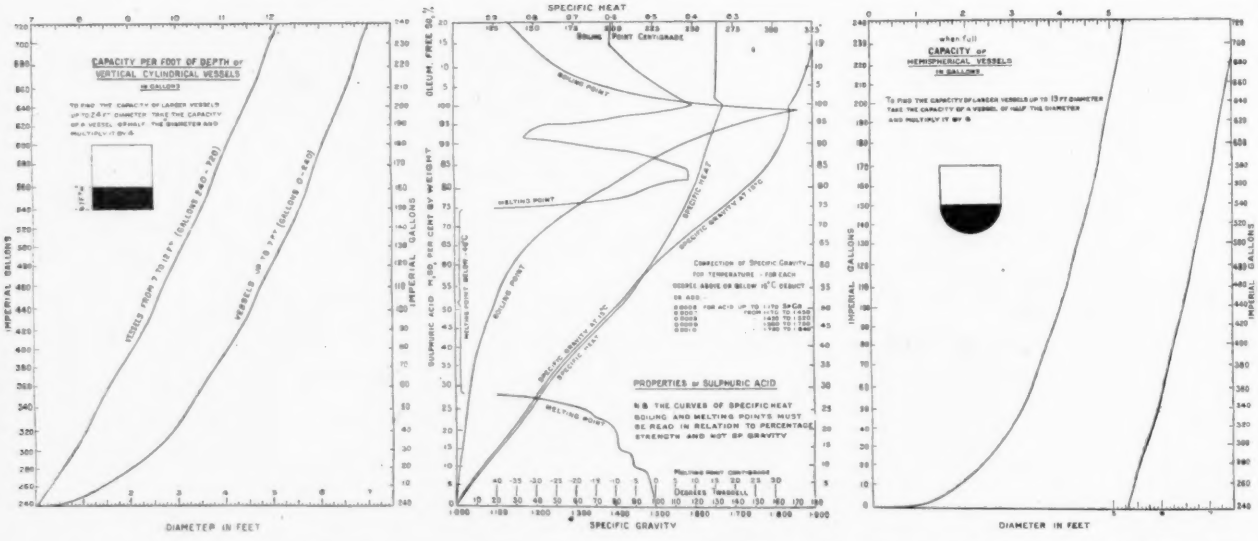
B.Th. U.=Degree-Fahrenheit-Pound

Atmospheric Pressure, (Standard)=14.689 lbs. per sq. in.
=29.92" Mercury.
=760 m/m Mercury.
=1.033 kg. per sq. cm.

Pressure :—1 lb. per sq. in. =2.037" Mercury.
=51.7 m/m Mercury.
=0.07 kg. per sq. cm.

Volume :—1 cubic foot per pound=0.0624 cubic metre per kilo.

PRESSURES. Gauge. Lbs./sq. in.	PRESSURES. Absolute. Lbs./sq. in.	TEMPERATURES. Cent.	TEMPERATURES. Fahr.	LATENT HEAT. per pound C.P.U.	LATENT HEAT. per pound B.Th.U.	TOTAL HEAT. from 0° C. C.P.U.	TOTAL HEAT. from 32° F. B.Th.U.	VOLUME & WEIGHT. Cubic Feet per pound.	VOLUME & WEIGHT. Pounds per cu. ft.
1 lb.	15.7	102.1	216	538	968	640	1152	25.1	.0398
2	16.7	103.7	218	537	967	641	1153	23.7	.0422
3	17.7	105.3	221	536	965	641	1155	22.5	.0444
5	19.7	108.5	227	534	962	643	1157	20.3	.0493
7	21.7	111.3	232	532	959	644	1159	18.6	.0538
10	24.7	115.2	239	530	954	645	1161	16.5	.0606
12	26.7	117.7	244	528	951	646	1163	15.3	.0654
15	29.7	121.0	250	526	948	647	1165	13.9	.0719
17	31.7	123.0	253	525	946	648	1167	13.0	.0769
20	34.7	126.0	259	523	942	649	1169	12.0	.0833
22	36.7	127.7	262	522	940	650	1170	11.4	.0877
25	39.7	130.5	267	520	936	651	1171	10.6	.0943
27	41.7	132.0	270	519	934	651	1173	10.1	.0990
30	44.7	134.5	274	517	931	652	1174	9.43	.106
35	49.7	138.0	280	515	927	653	1176	8.56	.117
40	54.7	141.4	286	513	923	655	1178	7.83	.128
45	59.7	144.5	292	510	918	656	1180	7.23	.138
50	64.7	147.5	297	508	914	657	1182	6.68	.150
55	69.7	150.2	302	506	911	658	1183	6.25	.160
60	74.7	152.9	307	505	909	658	1185	5.90	.169
65	79.7	155.4	312	503	905	659	1187	5.50	.182
70	84.7	157.8	316	501	903	660	1188	5.20	.192
75	89.7	160.0	320	499	898	661	1189	4.93	.203
80	94.7	162.0	324	498	896	661	1190	4.69	.213
85	99.7	164.0	327	496	894	662	1191	4.46	.224
90	104.7	166.0	331	494	890	662	1192	4.26	.235
95	109.7	167.9	334	493	887	663	1193	4.08	.245
100	114.7	169.7	337	492	886	663	1194	3.91	.256
110	124.7	173.4	344	489	880	664	1196	3.62	.276
120	134.7	176.6	350	486	875	665	1197	3.37	.297
130	144.7	179.8	356	484	871	666	1199	3.16	.316
140	154.7	182.6	361	482	868	667	1200	2.99	.334
150	164.7	185.5	366	480	864	668	1202	2.79	.358
175	189.7	192.0	378	474	853	669	1204	2.44	.410
200	214.7	197.5	387	470	846	670	1207	2.17	.461
225	239.7	203.0	397	465	837	672	1209	1.96	.510
250	264.7	208.0	406	460	829	673	1211	1.78	.562
275	289.7	212.5	414	456	822	674	1212	1.63	.613
300	314.7	216.7	422	453	815	674	1214	1.51	.662
325	339.7	220.7	429	449	809	675	1215	1.41	.709
350	364.7	225.3	438	445	801	676	1217	1.32	.758
375	389.7	228.3	443	442	796	677	1218	1.24	.806
400	414.7	231.8	449	439	790	677	1219	1.17	.855
450	464.7	238.3	461	432	778	678	1221	1.10	.909
500	514.7	244.3	472	426	768	679	1223	.95	1.053



The actual sheets reproduced above measure 10½ in. by 9 in. and the curves are plotted on squared paper ruled with millimetre divisions.

Mr. TALBOT stated that the amount they had put into the Society's coffers was slightly less than £450. Last year they received £100, and this year £150, so that there was a considerable balance on the Society's side.

Professor HINCHLEY said that in the recent negotiations it was proposed to grant the Group £150 in cash, and to allow the Group an expenditure on printing, &c., up to another £150. The Group was to have full control of its publications, with the exception that the Publication Committee of the Society would have some voice in the "get-up" of the publications. It was understood that any income from the advertisements in the "Proceedings" should belong to the Group, but now they found to their surprise that there was a misunderstanding on that point, and that the Society now claimed that income.

On the motion of Mr. MACNAB, seconded by Mr. SUTTON, it was decided to make a levy of 7s. 6d. on the members to clear off the deficit.

The CHAIRMAN also explained the difficulties which had arisen in the course of the negotiations with the Society, and said that the Group considered it very important that they should get the income from the advertisements. (Hear, hear.) The negotiations would be continued in the hope of arriving at a settlement on that point.

On the motion of Mr. GARLAND, seconded by Mr. ALLIOTT, Messrs. Hughes & Allen were re-elected auditors and accountants.

Hon. Secretary's Report

In reporting informally on the work of the past year, Mr. TALBOT referred to the standardisation movement, and announced that a number of data sheets had been prepared and would shortly be available to members. The connexion of the Group with such bodies as the British Chemical Standards Association and the Association of British Chemical Manufacturers continued to develop, and in these matters Mr. Alliott maintained the interests of the Group with equal dignity to the members and credit to himself. (Applause.) In connexion with the proposed Chemical Engineers Registration Bill, which might have seriously affected the interests of chemical engineers, as the result of the action taken by the Group it was understood that the Bill had been dropped. The conferences of the Group had been completely successful from the educational point of view. It was very important that the membership should be increased by every possible means. The committee were doing their utmost in this matter, and it devolved upon each member to assist.

On the motion of the CHAIRMAN, seconded by Mr. GREENE, the report was adopted.

Wasted Time

Professor HINCHLEY, in referring to the work of the year, said that had they not spent so much time in negotiations with the Society they would have had time for the more profitable work for which they existed, and the loss of time was much to be deplored. Their feeling was that they had not had fair dealing in the past, and he hoped that matters would improve in future.

New Officers

The following were elected to four vacancies on the committee: Messrs. P. Parrish, H. J. Pooley, S. J. M. Ewer and W. Macnab.

It was announced that Mr. J. A. Reavell (chairman), Mr. F. H. Rogers (hon. treasurer), and Mr. H. Talbot (hon. secretary) had been re-elected for the coming year.

The meeting concluded with a hearty vote of thanks to the officers for the past year.

Annual Dinner

President's Address on The Future of Chemical Engineering

The members afterwards dined together, under the presidency of Mr. Reavell, who after the toast of "The King" delivered an address on "The Future of Chemical Engineering."

The PRESIDENT said that the present condition of chemical engineering in this country was not as bright and promising as when they met a year ago. Like all other manufacturers of machinery, they had to face very difficult conditions which rendered it almost impossible to make any promises regarding deliveries, or to put forward proposals for chemical plant which enabled the users to go into new schemes with any degree of confidence. They had also to face fierce competition from abroad, because already buyers were turning to Germany and to America for plant which during the war they bought in this country. There was also the difference in the rate of exchange, which was helping competitors and was very damaging to this country. What, then, was the position of the chemical engineering industry under what appear to be such depressing conditions? His answer was that a Britisher was never more dangerous to his enemy than when everything seemed perfectly hopeless. The future, therefore, was not so black as it appeared; with the obstinacy and tenacity of the race they would be able to put up a fight for the world's trade that would be a surprise to everyone.

Some Difficult Problems

"The future of our industry," Mr. Reavell proceeded, "is going to be closely bound up with the question of the attitude of the Government to what have been spoken of as 'key industries.' I am not going to start a political speech, but I feel most positively that the Government of this country must decide once and for all whether it is going to protect key industries, or to leave our manufacturers and traders to take care of themselves. It is the present uncertainty that prevents those interested from deciding in which direction they shall work, as they cannot begin new works or extend old works unless there is some fixed national policy on such a vital point. Personally, I feel that unless the nations agree to disarmament throughout the world, some of our resources which eventually must be used for our own protection in time of war, will have to be protected during times of peace.

"The most serious menace to our future progress is the present unsettled condition of labour. Going about the country as I do, and meeting all classes of men, I find that the average decent man, who represents labour, is anxious to return to more normal conditions. I feel sure you will agree that it is the duty of all of us to encourage this spirit, and to do our utmost to get back to normal conditions. Until conditions are stabilised, we cannot expect to interest capital, which is, after all, one of the vital forces of the industry, and without which nothing great can be accomplished. We, who represent the brains of the industry, and the workmen, who represent the brawn of the industry, are the people in whom the capitalist must have confidence before he is likely to give his support. It is incumbent on us all to get British capital associated with our industry for its benefit as well as ours.

"One has only to look back to pre-war times and see how the German capitalist and the German manufacturer worked so closely together to their mutual profit. The banks were financially interested in manufacture, and in their financing of schemes abroad always insisted that machinery and plant should be made in Germany—thus helping the capital which they themselves had put into industry at home. I am well aware that German banks finance in an entirely different way from British banks, and I am not here to criticise either of the systems, but we have men and groups of men who finance large schemes, and what one wants to see is the same co-operation between those who are financing the scheme, and those who manufacture the plant, as is found in other countries. The financier, like the manufacturer, looks for the best market for his goods, and it must be a great temptation for him with the present rate of exchange to take advantage of foreign purchases. This, however, is no help to either party, if in the end the whole country is the poorer because of it. This is one of the most important points that affect the future of our chemical industry.

Standardisation

"There is another thing that will materially affect the future of the industry, namely, whether or no it can produce its product or plant at a competitive price in the markets of the world, and in order to minimise cost there has been of late a rush—ir might even be called a craze—for standardisation. Standardisation has many great advantages, but standardisation run mad will be detrimental, and not helpful to the industry. The success of British engineers and chemists has been due to their individuality, so that if the best is to be obtained industrial effort must not be cramped by carrying

standardisation too far. There is no doubt that a considerable amount of standardisation can be carried out, but let it be for those parts that are in common use, so that it can at once become a reality and not a sham. Only in this way can standardisation be of help in the future of the industry.

"If the future of our industry is to be as bright and strong as we all wish, we must encourage efficiency in every direction. The rule of thumb working of the past must disappear, and properly trained technical staffs must be available in order to meet the ever-changing and varied problems that chemical industry presents to us. We must not forget, also, that the future of chemical engineering is bound up with the future of the chemist. Our duty as chemical engineers is to put into practice the results of the research and experiments of the chemist, so that unless we have originality of thought and research on the right lines it is impossible for us to hold our own and get our fair share of the world's trade. The war showed clearly enough that the chemical engineer in this country was full of resource and capable of solving the most difficult problems.

"While I am a strong believer in the future of chemical engineering, I equally feel that every chemical engineer in this country must rally round the Chemical Engineering Group, so as to make it a huge success. Chemical engineering finds so many applications in the most varied industries and covers such a wide field that an organisation for its development ought to have a much larger membership than has so far been achieved, It is necessary for much missionary work still to be done, for, as the late Lord Moulton said at one of his public appearances shortly before his lamented death, the future progress and prosperity of this country is in the hands of the chemical engineer."

The Parent Society

In proposing "The Parent Society," the chairman said that although they had had some difficulties they felt sure that the President and the most influential members of the Council were thoroughly in sympathy with the work and the aims of the Group, and would do all that was possible to help.

Mr. GARLAND, who responded in a humorous speech, pleaded for a good understanding on both sides.

Chemical Engineering Group

Professor HINCHLEY, in proposing the toast of the Group, said that experience had revealed a necessity for a professional body apart from an educational body like the Group. When the Group was formed they discussed the question whether the time was ripe for a professional body, but the general feeling was that it was not ripe. There was now, however, a considerable number of people all over the country who favoured the formation of an Institute of Chemical Engineering. Such an Institute would be started, if not in London, somewhere else, and they should be in a position to take the matter up. If an Institute were formed a large part of the work which the Group set out to do might be done by the professional body, the Group continuing to do the educational side of the work. He had ventured to send round a paper asking the opinions of those present on the subject, and he made no apology for frankly explaining the position.

As to the coming year, Professor HINCHLEY said he was looking forward to a year of great activity. At the last meeting of the committee it was decided to set up sub-committees, and he would not be content until they had 100 capable men at work on the subjects they specially understood.

Mr. TALBOT, in responding, said that the work had hitherto been confined to a relatively small number of members, and with more co-operation their activities could be greatly extended.

First Volume of "Proceedings"

IT is a pleasure to welcome the first annual volume of "Proceedings" of the Chemical Engineering Group (published by the Group from 24, Buckingham Street, Strand, London), with its suggestive and attractive accounts of its first conferences on "Power Plant in Chemical Works." The volume opens with a general statement of the reasons for the formation of the Group, which may be worth putting on record as a fragment of history :—

"The Chemical Engineering Group is the first of what have been termed 'Subject Groups' of the Society of Chemical Industry, *i.e.*, it has as the main purpose of its formation and existence the promotion of the study and the development of the practice of a particular phase of chemical technology, viz., Chemical Engineering, as contrasted with the purely geographical significance of a 'Local Section' of the Society. The Society itself, covering as it does in its activities the whole domain of chemical technology, can only occasionally, and not at all exclusively and systematically, take account of chemical engineering matters, and although in the earlier years of its existence the question of the design and working of chemical plant entered more largely than now (1920) into its deliberations, the enormous amount of chemical discovery effected during the past half-century has almost inevitably resulted in attention being devoted to the examination of possibly useful reactions, processes and methods, rather than to the development of efficiency in plant for established manufactures. Other factors certainly assisted in bringing about this state of affairs, but there can be no doubt that the most important influence in effecting this change in the character of the Society's discussions during the period referred to has just been stated.

"It resulted therefore that at the beginning of the present century the study of chemical engineering had fallen somewhat into the background, and to the stress of the European War of 1914-1918 is to be attributed the responsibility for bringing its importance once more into prominence. The reasons for this are given in contemporary accounts of the chemical and explosive manufacturing activities of this country during the period referred to, and will not be further mentioned. A matter of more permanent moment is the attention that was again focused on the question of chemical plant and its efficient design, construction and working. It became increasingly evident that studies of plant were, at any rate, equally important with consideration of process—nay, more, *were vital to the successful operation of any process.* In consequence there developed in this country an influential body of opinion in favour of united action towards securing for the study of chemical engineering that place in the intellectual life of national industry which its obvious importance demanded. The guiding hand behind all the activities thereupon set in work was undoubtedly that of Professor J. W. Hinchley."

As regards the general contents, the opening remarks of the President of the Society of Chemical Industry, Professor Henry Louis, and M. Paul Kestner, at the first conference held in London, give point to the necessity for the special study of chemical engineering. A paper by C. J. Goodwin gives a thoughtful account of the utilisation of waste heat by means of waste heat boilers and the use of pulverised fuel. Measurement is the essential feature of any kind of engineering, and the paper by J. L. Hodgson on "Differential Pressure Meters for Measuring Air, Gas and Steam Flow," is an excellent summary of this important question. In our opinion, the paper is too short, and we hope to see the subject carried further at a future conference. The account by Professor W. A. Bone and P. St. G. Kirke, of the "Recent Developments in Surface Combustion Boilers," is a useful statement of the present position of this new type of boiler. The papers by P. Parrish and Professor J. W. Hinchley raise important questions in fuel economy. Mr. Parrish deals with the burning of low-grade fuel in steam boilers in a very thorough manner, and the record of stimulating discussion is very suggestive and useful.

At the second conference held at Newcastle-on-Tyne, an exhaustive series of papers on pumps, elevators and the transport of liquids was presented. The present Chairman of the Group, J. Arthur Reavell, gives an account of the "Kestner Acid Elevators"; R. Stewart describes the "Marclen" Glandless Acid Pump, R. A. Pelmore the "Avamore" "Squeegee" pump, S. J. Tungay the Centrifugal pumps of "Ironac," and W. Hayhurst the "Armoured Ceratherm Centrifugal Pump." These papers are of great interest, and give quantitative information of value, but we should like to hear still more of the subject.

An exhaustive paper on "Pumping Machinery for Chemical Works" is contributed by J. H. West. The paper gives an excellent outline of the problem of pumping in general, and an account, with illustrations of all the more important pumps, forming an invaluable and comprehensive guide for the chemical engineer in the selection of a pump for a given job. A data sheet and an appendix add greatly to the value of the paper, by giving data in a form which can be used without

much mental effort on the spur of the moment. A paper by H. W. Crow on his "System of Liquid Distribution in Chemical Factories" is interesting, and a descriptive paper by A. Anfilogoff on the "Handling of Petroleum in Bulk at Thames Haven," is suggestive and helpful.

The volume is very readable, and is brightened by a number of excellent illustrations, and it may be heartily recommended to all practical men of the chemical industry.

Group Personalities

The following notes are supplied by a contributor on the members of the Group whose photographs appear on another page :—

HINCHLEY, Professor J. W., Wh.Sc., F.I.C., Founder and First Chairman of the Chemical Engineering Group. Member of the General Publication and Finance Committees of the Group and Convener of the Data Sheet Sub-Committee. Professor of Chemical Engineering in the Imperial College of Science and Technology, London. Hobby, Acquiring chemical plant. Recreation, Billiards.

ALLIOTT, E. A., B.Sc. (Eng.), A.M.Inst.C.E., A.M.Inst.M.E., Member of the General, Finance and Data Sheet Committees of the Group. The Group's unofficial missionary; has been responsible for the spread of the gospel in many previously unenlightened quarters. Director of Manlove Alliott & Co., Nottingham and London. Hobby, Writing scientific papers. Recreation, Reading scientific papers.

FLINT, A. C., Assistant Secretary of the Group since September, 1919. A glutton for work. Is all things to all men. Hobby doing the Group's work. Recreation, sending receipts for Group's subscriptions and donations.

GARLAND, C. S., B.Sc., A.R.C.Sc., F.C.S., F.I.C., Member of the General and Finance Committees of the Group. Wise in counsel and subtle in debate. Managing Director of Lighting Trades branch of Nobel Industries, Ltd. Hobby, Attending Council meetings. Recreation, Going to Manchester.

GOODWIN, Capt. C. J., B.Sc. (Eng.), A.C.G.I., A.M.Inst.,C.E., member of the General, Publication and Data Sheet Committees of the Group. One of the main supporters of the Group since its inception. Consulting Chemical Engineer. Hobby, Reading Minutes. Recreation, Criticising Minutes.

REAVELL, J. Arthur, M.I.M.E., Chairman of the Chemical Engineering Group, 1920. Re-elected for 1921. An experienced and diplomatic chairman, ready at all times to sacrifice his personal convenience to the Group's interests. Managing Director of the Kestner Evaporator and Engineering Co., Ltd. Motto, "Let's get a move on." Hobby, Work. Recreation, More Work.

ROGERS, F. H., M.I.M.E, Member of the General and Data Sheet Committee of the Group. Hon. Treasurer and Chairman of the Finance Committee. Consulting Engineer and Patent Agent. The Group's financial genius. Hobby, counting the Group's money. Recreation, finding some more money to count.

TALBOT, H. B.Sc., A.R.C.Sc., Hon. Secretary of the Chemical Engineering Group since its foundation. Has burnt much midnight oil in endeavouring to push forward the Group's work. Hobby, writing Minutes. Recreation, addressing envelopes.

Chemical Merchant's Affairs

AN adjourned meeting of creditors under the receiving order made against Heinrich Odomar Hugo Wiskemann, chemical merchant and manufacturer, 106, Wool Exchange, E.C., was held last week at the London Bankruptcy Court to consider a scheme for the arrangement of the debtor's affairs.

The Official Receiver's report stated that under the scheme all the debtor's assets were to rest in a trustee for the benefit of creditors, and, in addition, the debtor would cause to be deposited with the Official Receiver such sum (not exceeding £2,000) as would pay a dividend of 2s. 6d. in the £ over and above the amount received from the realisation of the estate.

An amended statement of the debtor's affairs showed unsecured liabilities £11,012 and net assets valued at £6,975.

The Official Receiver was of opinion that as the debtor's offer provided for the payment to the creditors of 2s. 6d. in the £ over and above a realisation in bankruptcy the proposal appeared to be reasonable, and calculated to benefit the general body of creditors.

The creditors resolved to accept the scheme.

Industrial Alcohol

Its Manufacture from Rice Straw

LORD SOUTHBOROUGH presided at a meeting of the Royal Society of Arts on May 27, when SIR CHARLES BEDFORD read a paper before the Indian and Colonial Sections on Industrial (including Power) Alcohol.

Sir Charles Bedford said that, in any survey of the subject of establishing within the British Empire a great industrial alcohol industry, the subject-matter would fall under four main headings : (1) The production of alcohol in assured quantities at the lowest possible cost. (2) The denaturation of the alcohol so as to secure relief from the heavy duties levied on potable spirits. (3) Removal or modification of many of the existing Customs and Excise restrictions on industrial alcohol during its manufacture, storage and distribution. (4) Modifications of the internal combustion engine to obtain the best results with alcohol, alone or in admixture with other substances.

Hitherto in the United Kingdom alcohol had been almost entirely made from molasses and grain (maize chiefly), and there were no better sources if they could be obtained cheaply enough. At the present moment, however, the prices of both were prohibitive for alcohol manufacture on the large scale. In the United States cane or blackstrap molasses had been mainly used for this purpose. In Germany, the potato was the chief raw material used in industrial alcohol manufacture. In France, beet was perhaps the characteristic raw material for industrial alcohol production, along with molasses and grains.

The Present Position

Nothing, perhaps, could better illustrate the present position as regards the United Kingdom and some of the Crown Colonies than the recent activities of the largest and perhaps most progressive distillery company in this country. Recognising the hopelessness of large-scale manufacture of industrial alcohol here, they sent experts to Africa, British Guiana, to Fiji and elsewhere to ascertain the possibilities of developing alcohol manufacture on a large scale. It was understood that their enquiries had been more especially directed to the raw materials with which they had long working experience, and that the results hitherto had been discouraging. They had apparently found that, even apart from labour and transport difficulties, raw materials which had a use as foodstuffs fetched a market price which precluded their use as sources of industrial alcohol. The results of these enquiries were distinctly disappointing, especially as it was most desirable that the agencies for alcohol manufacture should be as much as possible spread over the whole Empire, primarily for the benefit of the producing countries and secondarily for the limitation of possible monopolistic efforts on the part of certain powerful financial interests.

The lecturer said he had been engaged for the last two years in the investigation of certain new raw materials which were waste or semi-waste in character, and which were obtainable in practically unlimited quantities within the confines of the British Empire. Since 1914, when he had occasion first to study empire conditions as regards raw materials for alcohol production, the conclusion had been increasingly forced on him that attention should be concentrated on waste vegetable materials rather than on foodstuffs. In 1918-19 the idea of employing rice straw for making alcohol was first proposed to him by Mr. Arthur Rogers, C.B.E., and together they jointly agreed to patent a process for the purpose. He decided on Burma as being the most likely sphere for operations, and was fortunate enough to secure financial support from the Burma Oil Co. His next step was to erect a distillery and the requisite laboratory and other adjuncts at the company's refineries at Rangoon. The necessary experimental work had been carried out and was still in progress, but should now shortly be far enough advanced for initial requirements.

An interesting discussion followed, in which Lord Southborough, Sir Frederick Nathan, Dr. W. R. Ormandy, Dr. F. Molton Perkin, Mr. E. S. Shrapnell-Smith and Mr. B. Morgan took part.

During April the United Kingdom imports of German dyes and dyestuffs amounted to £19,777, a decrease of £96,694 on the March total. The drop was mainly noticeable in alizarine and synthetic indigo.

The Case for Chemical Warfare

WE have pleasure in publishing the following contributions, in reference to Sir William Pope's recent article on this subject, from the Right Hon. Sir T. Clifford Allbutt, K.C.B., F.R.S., Regius Professor of Physic in the University of Cambridge, and Professor A. E. Boycott, University College Hospital Medical School, London.

To the Editor of THE CHEMICAL AGE.

SIR,—I did not see Sir William Pope's "Case for Chemical Warfare," nor your leading article upon it, for some little while after their publication. As I am mentioned by Sir William as one of those who "grotesquely misinterpreted" the function of chemistry in war, I venture, notwithstanding the delay, to offer some brief reply, for the subject is one of no ephemeral interest. With your criticism of Sir William's article I am cordially in agreement; I am impressed, as you were, by the candour with which the distinguished author disclosed his point of view, with that coolness and sureness of his hand, and with the clearness and acuteness with which his case was stated. In your own able article it was not a part of your intention to point out every remarkable feature of Sir William's discourse; may I point out another?—a feature which by its very nature lies below the surface: The discourse is a masterpiece of irony, a piece not unworthy to stand beside the work of the great master of this mode. The irony is so profound, so masked, that some of your readers may have paid for carelessness of reading by missing the inward meaning. Swift himself never penned a more masterly paragraph than that in which Sir William gravely proves that in the last war preventive medicine was responsible for the slaughter of nine-tenths of 15,000,000 men; to which must be added our "distribution of epidemic disease among non-combatants in all quarters of the globe"; and again, "the civilian mortality from the mysterious war form of influenza alone amounted to scores of millions; and the death roll lies at the door of preventive medicine." Hygienists may be as much confounded with astonishment as were the Blefuscudians.

But if I were to attempt to illustrate the subtlety of Sir William's pen in all the parts of his discourse, and if a fuller illustration would enchant your readers, yet it would occupy more than an entire number of THE CHEMICAL AGE.

The key to this inimitable piece of craftsmanship is to be found on p. 526, col. 2, on the "theory of warfare": "War is very generally regarded as the highest form of sport." It was necessary for the author's purpose to avoid this point of view. Sports, of course, can be pursued only in virtue of certain conventions; each sport having its own. If war is a big game, the noble game as many persons regard it, it also must have its own conventions; such, for instance, as to give occasion to personal prowess and chivalry, to fine strategical conceptions in its leaders, and in its masses to loyalty and obedience. And so forth. What chivalry can a gasman show to a suffocated enemy? What personal prowess is there for a turncock? What occasion for a fine gesture? It is evident that no one sees more clearly, or feels more deeply, than Sir William Pope that under modern conditions warfare has ceased to engender even incidental virtues; that it has lost all or any redeeming qualities; that it has become a mere orgy of ingenious brutality and rapine. So let us agree that even poison gas can make it no worse. No! we will be grateful to him for his mordant demonstration and commentary; for if evil can be killed by satire his keen rapier should play no small part in our making a clean sweep of wars and all its ministers and tools.—I am, etc.,

Cambridge, May 31, 1921. CLIFFORD ALLBUTT.

To the Editor of THE CHEMICAL AGE

SIR,—With your leave I should like to make a few remarks on the article which appeared in your issue of May 7, by Sir William Pope, on "The Case for Chemical Warfare," and on your editorial note on it. I will put my case against the Professor of Chemistry in the University of Cambridge as shortly as possible.

1. He is a bad soldier, for he commends poison gas as being "far less fatal . . . than any other instrument of war," and as producing casualties "which, after six weeks in hospital, are discharged practically without permanent hurt." The object of offensive operations is to kill the enemy, not to hurt him, and if Sir William's version of what chemical warfare effects is a true one it follows that it must be a very secondary and subsidiary weapon and probably not worth very much attention. He is so much concerned in showing that the signatories of a letter in the *Times* of two and a half years ago exaggerated the effects of gas that he demonstrates that gas is of very little practical physical use. Either gas is a destructive instrument of war or it is not; he cannot have it both ways.

2. He is a bad gasser for one who has served so long on the Chemical Warfare Committee, for he says that "it will be a simple task to devise high explosives which will evolve large amounts of carbon monoxide, which is 'excessively poisonous.'" Surely Sir William knows that to produce by gas shell a concentration of CO which will do anyone any serious harm in the open is utterly impracticable; the matter was considered in detail on more than one occasion by the Committee on which he sat. Being a chemist, he may perhaps not be expected to know that CO cannot reasonably be described as "excessively poisonous" on the scale of notation with which gas warfare made us familiar. Taking the time factor into consideration, as, of course, one must, it is far less poisonous than phosgene or chloropicrin or several other substances, the names of which I have forgotten.

3. Pursuing his slogan of "Up with the chemist and down with the doctor!" Sir William then proposes that the real cause of the immense mortality of the war was preventive medicine; that it was preventive medicine alone which made it possible for military operations on so vast a scale to be carried on for so long; that the withdrawal of doctors from the civilian population was the cause of the continued and continuing epidemics in Central Europe and elsewhere. On this last count he is, of course, wrong; he wants so much to prove that preventive medicine is all-powerful that he flatters the doctors beyond all reason. All the young and active doctors in the world would have made very little impression on the epidemic of influenza in India or South Africa or Cambridge; the epidemic of typhus in Poland is not due to the absence of doctors but to the absence of soap and hot water; there are plenty of doctors in Vienna, but there is very little food.

In saying that the armies would have perished of disease and the war come to a speedier end in the absence of preventive medicine he is, of course, right in the sense that he would be right to lay the same charge of prolonging the war at the door of those who make boots and grow corn—or indeed make explosives or toil at infant welfare centres. But he is pitiably astray in his estimate of the causes of human action. He talks as if the object of preventive medicine was the maintenance of men alive in order that they might be killed. Is he really unaware of the belief which is inherent in the human mind that life is better than death? It is an axiomatic conviction, developed a little more highly in medical men than others, that existence on almost any terms is better than non-existence. No serious-minded man is going to waste his time discussing whether life is worth living or not: he knows as surely as he knows anything that life is worth preserving. Does Sir William really fail to notice that those who serve preventive medicine are serving a fundamental human ideal which survives even the degradation of war—an ideal to which he subscribes himself in his desire for gases which will not kill? It would be difficult to believe that he is serious were it not equally hard to believe that any *farceur* would choose such a sorry subject. I would hazard a guess that what he really wants to do is to boost the importance of chemistry; we should less readily withdraw the assent we have already given to his cause if he would proceed by other methods than those of propaganda which, as we are told, is the brother of the proper goose. It does a burglar's case no good to prove that another man is a murderer, and it is not an "effective argument," as you, Sir would have it, to say that medical men, who protest against gas warfare, are themselves responsible for a greater mortality; it is just a schoolboy's *tu quoque*.—Yours, etc.,

A. E. BOYCOTT.

University College Hospital
Medical School, Gower Street, W.C.1.
May 26.

Oil and Colour Chemists

Future Policy of the Association

THE annual meeting and dinner of the Oil and Colour Chemists' Association was held at the Holborn Restaurant, London, on May 26, Dr. R. S. MORRELL presiding.

The first business was the presentation of the Council's report for the year 1920/21, which states that the number of members is now 192, compared with 151 in the previous year and 131 in 1918/19. Of the total, 77 are London members, 101 are provincial members and 14 are foreign and colonial members.

According to the financial statement, there was a deficit of £5 os. 5d on the year's working, compared with £41 5s. 11d. in the previous year and £18 os. 9d. in the year before that. An anonymous donor has made good the deficit for last year. The capital account stands at £297 11s. 11d. The estimate for the coming year shows a small credit balance.

The Financial Position

The President, commenting upon the report, said it would be seen that the financial position was a pretty bad one, but he thought the members would recognise from the report that the Council had endeavoured to do its best for oil and colour chemists in the way of official recognition. Bearing on this, he would like to draw attention to the fact that the Faraday Society proposed to hold a discussion on the general properties of powders and they had asked the Oil and Colour Chemists Association to co-operate in that matter. They were now awaiting further information as to the date of the discussion and also as to how many members of the Association the Faraday Society would like to speak on the subject.

The Council nominated Dr. R. S. Morrell for the position of President, and that nomination was cordially confirmed, as were the Council's nominations of Dr. F. M. Perkin and Mr. S. K. Thornley as vice-presidents. Dr. Morrell said they would all welcome Mr. Thornley because he was President of the National Federation of Associated Paint, Colour and Varnish Manufacturers of the United Kingdom, and they all knew what a friend the Federation had been to the Oil and Colour Chemists Association. Messrs. S. G. Clifford and A. de Waele were elected to fill vacancies on the Council as London representatives and Messrs. J. B. Shaw and A. R. Warnes as provincial members. Mr. H. A. Carwood was unanimously re-elected hon. secretary and treasurer.

Annual Dinner

Dr. R. S. MORRELL, again presided at the annual dinner, which followed. After the usual loyal toasts, Dr. J. D. Longstaffe (General Secretary of the Society of Chemical Industry) proposed "The Oil and Colour Chemists Association." He said they were all looking forward to greater co-operation between societies and he understood that there had been some suggestion that there should be co-operation of a very close character between the Association and the Society of Chemical Industry. In other words, the proposal was that the Association should become a Group of the Society.

Dr. MORRELL in reply to the toast, thanked Dr. Longstaffe for his friendly remarks, coming as they did from the Secretary of such a powerful society as the Society of Chemical Industry to a very small association. He could see advantages in being connected with such a powerful and prosperous society as the Society of Chemical Industry. It would probably do something to raise the industry from the rule of thumb policy which existed largely at the moment, to a chemical and scientific policy. In connexion with the need for research among oil and colour chemists, there seemed to him to be three directions in which research would be of value to the industry; there was the solution of points of general interest; there was the preparation of ground work for future discoveries, and finally, there was the training in research of chemists who intended to devote their energies to the industry.

Exchange of Ideas

The toast of "The National Federation of Associated Paint, Colour and Varnish Manufacturers of the United Kingdom" was proposed by Dr. M. B. Blackler, in the absence of Dr. F. M. Perkin, who was originally to have proposed it. Dr. Blackler said he had known Mr. Thornley, the President of the Federation for many years, and he felt sure that he would bring into the Federation something of the spirit which should be associated with such a body.

Mr. S. K. THORNLEY, replying to the toast, said there was a growing feeling in the Federation that there was nothing in the industry to-day of such great importance as scientific research and the question of expert help, and that there was no such good investment as a really efficient chemist, a man who, by virtue of his skill and knowledge, could quite command an even bigger salary than they could afford to pay. The Federation owed the oil and colour chemists some gratitude for their broad mindedness in coming together some three years ago and for realising that there is more to be gained by getting together and exchanging knowledge than by keeping all the knowledge they had to themsleves.

The final toast of the evening, "Our Guests," was proposed by Dr. J. N. Goldsmith, who referred especially to Dr. J. J. Fox, Dr. Longstaffe and Mr. Thornley.

Dr. FOX who replied, recalled some of the restrictions under which the trade was put during the war, restrictions which he himself had a good deal to do with, and recounted some of the difficulties of administering such a war time department as that with which he had been connected.

Affairs of Walter Everitt, Ltd.

First Meeting of Creditors

THE first meeting of the creditors of Walter Everitt, Ltd., Norwood Wharf, Southall, Middlesex, analysts and manufacturing chemists, was held recently at 14, Bedford Row, London, W.C. According to the statement of affairs presented the gross liabilities amounted to £11,772 18s. 2d., of which £1,681 17s. was expected to rank for dividend. The assets were estimated to realise £10,325 10s. 1d., from which had to be deducted £9,783 11s. 2d. for loans on debentures, leaving £541 18s. 11d., or a deficiency as regarded the unsecured creditors of £1,139 18s. 11d. The Official Receiver stated that the receiver for the debenture holders was in possession of the assets. It appeared that the company was incorporated in September, 1919, as a private company, for the purpose of acquiring as a going concern the business of analysts and manufacturing chemists previously carried on by W. Everitt & Co., Ltd. The purchase price was £15,000, to which had to be added £487, the estimated value of the stock. This amount was satisfied by the allotment of 9,000 fully-paid shares and the issue of debentures for £6,500. The nominal capital of the company was £10,000 divided into 10,000 shares of £1 each. A net profit was shown of £60 18s. 11d. for the period to August 31, 1920. The present position was attributed to the fall in prices of materials as a result of foreign importations. The creditors decided that the matter should be left with the Official Receiver.

International Rubber Exhibition

THE International Exhibition of Rubber and other Tropical Products, which has not been held since June, 1914, was opened at the Royal Agricultural Hall on Friday by Sir Owen Philipps, M.P. There is a large and representative range of exhibits, and fifty-seven British and foreign Governments are participating.

The adjudicators in the Rubber Growers' Association Competition announce that they cannot make their award in time for the present exhibition. The reason for this is that certain suggestions put forward have necessitated a considerable amount of experimental work and tests in order to establish the practicability of the suggestions. The numerous entries, totalling nearly 2,000, have necessitated the holding of many meetings and long and careful consideration by the adjudicators. Certain experiments have been carried out already on the instructions of the adjudicators to test new processes and compounds suggested by the applicants, but in some cases these tests have not resulted in producing what is claimed, and the necessity may possibly arise for further explanations from, and possibly personal interviews with, certain of the competitors.

The Lord Mayor of Birmingham was to visit the exhibition to-day (Saturday), and to-morrow Lord Leverhulme will receive the foreign delegates at his residence at the Hill, North End, Hampstead. The Lord Mayor of London will visit the exhibition on June 13.

British Cellulose Position

Output and Quality of Silk

THE directors of the British Cellulose & Chemical Manufacturing Co., Ltd., have issued a circular in which they state that the report made by Mr. Chamberlain on the company's position in December last recommended an immediate restriction of programme, including the postponement of delivery of much plant. The plant to complete an output of 1 ton per day of silk is being completed, and until that amount is within sight of being produced and sold no further outlay will be made to increase production. The present output is about 1,000 lb. per day, and it is expected that 1 ton per day will be produced by the end of August. An output of 1 ton per day should show a profit, and every increase on that output greatly increases the rate of profit. This recent estimate of results is based on selling prices being less than those now being realised, raw materials at present market rates, and working costs at a figure which it now appears reasonable to expect when silk is coming through regularly. On a 3 ton output this estimate indicates that a satisfactory profit will be made. To produce the additional 1, 2 or 3 tons will require further cash. It is quite possible that this cash may be provided by the liquidation of some of the company's present assets, but if it is necessary to look outside for financial assistance, the position will be made easier by the evidence of actual sales and profits. The company's silk has been approved by the Post Office for use in their cable requirements, the only artificial silk in the world capable of being used as an alternative to natural silk for insulating purposes.

Owing to importations of carbide of calcium and other chemicals from Germany, Austria and other Continental countries, at prices which did not cover the bare cost of the coal and other raw materials in this country, it was necessary to close down the carbide and other chemical departments early this year. But if the Safeguarding of Industries Bill becomes law, the board are hopeful that these very vital branches of the company's activity will, in the interests of the nation, be scheduled as coming within the scope of the Act, and the factories will then be restarted.

Colour Manufacturer's Losses

FRANK YOUNG, of Love Lane, Wood Street, E.C., who had been interested in a project for the manufacture of chemical colours, attended at the London Bankruptcy Court on Tuesday for public examination on a statement of affairs showing gross liabilities £549,666, and an estimated deficiency in assets of £216,986. The debtor said that In 1917 he agreed to purchase a project for the manufacture of chemical colours and took premises at Verney Road, Rotherhithe. The business was carried on under the style of the Chemical Colour Company. In July, 1919, it was acquired by the Ajax Aniline Dye Manufacturing Co., Ltd. The company was still trading. The debtor attributed his failure to losses on war contracts, amounting to over £250,000 and to the slump in trade. The examination was concluded.

Bankrupt's Discharge Rescinded

AT the London Bankruptcy Court on May 25, Felice Bonaventura, trading with others as Felice Bonaventura & Co., produce and chemical merchants, of 24, Great Tower-street, E.C., applied for an order of discharge. The firm failed in October last, with liabilities amounting to £16,250.

Mr. E. PARKE, Official Receiver, reported that the assets had realised only £107, and no dividend could be paid to the creditors.

The failure of the firm was attributed to loss in trading, the general slump in business, and to depreciation in the value of stock. The Official Receiver was of opinion that it was in some part due to the excessive drawings of the applicant.

As grounds of opposition to the discharge, the Official Receiver submitted (1) that the assets were less than 10s. in the £; (2) that the debtor continued to trade after knowledge of insolvency; and (3) that he had contributed to the bankruptcy by unjustifiable extravagance in living.

On these grounds Mr. Registrar Hope suspended the discharge for two years and six months from January 19 last, when the public examination was concluded. (*See* THE CHEMICAL AGE, January 29, p. 140.)

Chemical Matters in Parliament

The Products Corporation

IN reply to questions by Lieut.-Col. Sir F. Hall (House of Commons, May 30), Mr. Baldwin said the inquiries as to the constitution of the Products Corporation, Ltd., were proceeding, but he could give no definite reply until these investigations were completed.

White Lead in Paint

Major Mackenzie Wood (House of Commons, May 30), asked in view of the fact that the prohibition of the use of white lead in painting was one of the items on the agenda of the Third International Labour Conference to be held at Geneva in October, whether any special practice prevailed in His Majesty's Office of Works with regard to the use of white-lead compounds in painting; if so, what that practice was; and whether any condition relating to the use of white lead was contained in Government contracts for painting work?

Lieut.-Col. Sir J. Gilmour said the practice of the Office of Works for the last 14 years had been to use paints with a non-poisonous zinc base instead of a white-lead base and all contracts involving painting stipulated that no paint must contain more than 5 per cent. of soluble lead.

Safeguarding of Industries

In the House of Commons on Tuesday, on the report stage of the financial resolution Major Barnes moved an amendment to reduce the period of protection from five to three years. On a division the amendment was negatived by 203 votes to 81.

Dr. Murray, moved an amendment to reduce the duty from 33⅓ to 10 per cent. On a division the amendment was defeated by 244 to 79.

Dr. Murray moved the omission of optical glasses, but the amendment was defeated by 209 to 70.

Mr. Newbold moved the omission of arc-lamp carbons. This amendment was negatived by 168 to 75.

Sir Godfrey Collins moved an amendment substituting both Houses of Parliament for the Board of Trade as the authority for defining the articles which would come under the resolution.

The resolution as a whole was carried by 194 to 74.

On Wednesday after a stormy discussion the Speaker put the question that the second resolution be agreed to. There was then a division in which the Government had a majority of 169, 171 voting for the motion and 2 against. The closure was finally carried by 152 to 52.

Excess Profits Duty

Captain Wedgwood Benn (House of Commons, May 25 asked the Financial Secretary to the Treasury whether, when a holding of War Loan had been treated for purposes of Excess Profits Duty as an asset employed in the business, a deduction was allowable in the computation of profits in respect of the net amount of any depreciation in value arising in the period during which the War Loan was treated as an asset so employed; and, if so, whether the depreciation in value which was referred to was the difference between the amount subscribed for the War Loan and the amount realised therefor or, if not realised, the difference between the amount subscribed and the value at the close of the last accounting period?

Mr. Young said the answer to the first part of the question was in the affirmative. Assuming that the War Loan was regarded for purposes of the Excess Profits Duty as part of the capital employed in the taxpayer's business throughout the accounting periods during which it was held by him, the depreciation would, subject to Clause 23 of the Finance Bill becoming law, normally be measured by the difference between the cost price and sale price if sold before December 31, 1921, or between the cost price and the value at December 31, 1921, if held until that date.

Chemical Exporter's Liabilities

UNDER the compulsory winding-up order made last December against Hill Bros. (London), Ltd., chemical exporters, of 5, Fenchurch Street, E.C., Mr. H. E. Burgess, Official Receiver, has issued a summary of the company's statement of affairs showing gross liabilities £9,814, expected to rank for £6,889, and no available assets. As regards shareholders, a deficiency of £17,602 is disclosed, making a total deficiency of £24,491. The Official Receiver is acting as liquidator.

From Week to Week

Dr. L. DOBBIN has been appointed Reader in Chemistry in the University of Edinburgh.

Mr. H. Talbot, B.Sc., A.R.C.Sc., has been appointed general manager of the Welsbach Light Co., Ltd.

Mr. R. RAPER, of Caius College, Cambridge, is the successful candidate for the Goldsmiths' Company's Exhibition in Chemistry.

Mr. J. A. R. BURBANK, chemist, of Walton Street, Oxford, has been nominated to the Executive Committee of the Oxford Central Conservative Council.

The Senate of the University of London has conferred the degree of D.Sc. in Chemistry upon Mr. H. YAROSLAV, a student at University College.

Mr. W. J. U. WOOLCOCK, M.P., has been elected as an Ordinary Member of the Council of the Society of Chemical Industry in place of Mr. W. J. A. Butterfield, who has resigned.

Dr. E. J. RUSSELL, director of the Rothamsted Experimental Station, has been appointed a foreign Corresponding Member of the Reale Instituto Lombardo di Scienze e Lettere di Milano.

The Blackley war memorial, which takes the form of a monument, was unveiled on May 28 by Dr. HERBERT LEVINSTEIN, a director of the British Dyestuffs Corporation, Ltd.

The Horne Engineering Co., of 11, St. Peter's Lane, Glasgow, announce that they have removed to a NEW WORKS at 35, Pitt Street, Glasgow. The telephone number (Central 1204) remains unchanged.

We note that Mr. E. BERNARD COOK, of Johnson & Sons, Manufacturing Chemists, Ltd., of 23, Cross Street, E.C. 2, who has been indisposed for some time, has now made a satisfactory recovery.

The Sun Fuel Co., Ltd., announce that Sir ARTHUR WHINNEY, K.B.E., has been appointed receiver and manager of the undertaking, and will continue to carry on the business with a view to its reorganisation.

During the next few days two large tank steamers from the Anglo-Persian Co.'s oilfields will discharge cargoes of CRUDE OIL at Swansea docks, and will be followed in rapid succession by other vessels with similar cargoes.

An outbreak of FIRE IN A LABORATORY belonging to Mr. Robert Scott, of Hawick, is reported to have caused damage amounting to several hundred pounds through the destruction of drugs, instruments, &c.

On his departure from Cardiff to manage the Exeter branch of the Anglo-American Oil Co., Ltd., Mr. C. H. MAGGS was presented by the staff of the local branch with a gold watch, and Mrs. Maggs with a set of fish carvers.

A considerable amount of damage has been caused by a FIRE at the works of the Norcroft Dyeing Co., Water Lane, Thornton Road, Bradford. The cause of the outbreak is not known, but the damage is covered by insurance.

According to statistics issued by the Banking Section of the Department of Overseas Trade, capital increases by limited liability CHEMICAL COMPANIES during April totalled £50,000. Companies dealing with oils and fats increased their capital by £23,000.

We are glad to learn that Mr. F. E. Weston (whose second article on "Colloidal Clay" appears in this issue) is rapidly recovering from the effects of his recent illness and hopes to resume his duties as chief of the Polytechnic Chemical Department within a few weeks.

AN OUTBREAK OF FIRE, believed to have been caused by a spark from a passing engine setting fire to three oil tanks on the railway side, occurred at the works of Messrs. Edward Ripley & Son, Ltd., Bowling Dyeworks, Bradford. The damage is covered by insurance.

Owing to the postponement of the sailing of the "Celtic," on which he had booked his passage from America, PROFESSOR EINSTEIN will be unable to lecture at King's College, London, until Monday, June 13, at 5.15 p.m. All the tickets which have been issued for June 9 will be available for that date.

Considerable discussion has been aroused in Glasgow by the recommendation of the Board of Trade Committee to discontinue the British Industries Fair at Glasgow. It has been suggested that a chemical trade fair should be held at the Kelvin Halls if sufficient support is forthcoming.

Owing to the miners' strike, and difficulties in connexion with the railway services, the Council of THE MINING INSTITUTE OF SCOTLAND have decided that the General Meeting of the Institute, arranged to be held on June 11 in the Heriot Watt College, Edinburgh, should be cancelled.

An experimental consignment of the new PATENT ALCOHOL FUEL "Natalite," has arrived at the Port of London per ss. "Cluny Castle" from South Africa. Natalite has been manufactured, and has been in general use in South Africa, for four years. The whole of the first consignment will be used for demonstration and experimental purposes.

We understand that Mr. CHARLES WALTER GOFF has been appointed to a seat on the board of directors of Robert Ingham Clark & Co., Ltd., varnish and enamel manufacturers, of West Ham Abbey. Mr. Goff is senior partner in the firm of Messrs. Goff & Penn, chairman of William Gowlland (1916), Ltd., and a director of the Coventry Chain Co., Ltd., and the Coventry Repetition Co., Ltd.

At a meeting of the Bristol University Council on May 27, Sir ISAMBARD OWEN, Vice-Chancellor of Bristol University since its foundation in 1909, announced that he must retire at the close of the present term under the new rules of the Treasury regarding superannuation at the age of 70. Members of the Council expressed deep regret and a sense of the great loss involved by Sir Isambard's retirement.

Practically the whole of the boiler plants of the British Oil & Cake Mills, Ltd., have been converted for the burning of OIL FUEL. In this connexion Mr. J. W. Pearson, chairman and managing director of the firm, stated in his speech at the annual meeting held on Tuesday that since they had installed the oil fuel installations it had been found possible to burn a large amount of their own refinery refuse materials, which from time to time are almost unmarketable.

The following have been elected Officers of the ASSOCIATION OF TEACHERS IN TECHNICAL INSTITUTIONS for the year 1921-1922 :—President : Principal G. Knox (South Wales School of Mines) ; Vice-President : Mr. J. Paley Yorke (L.C.C. School of Engineering, Poplar) : Ex-President : Mr. E. L. Rhead (School of Technology, Manchester) ; Hon. Secretary : Mr. W. W. Sirman (Technical School, Handsworth) ; and Hon. Treasurer : Mr. J. W. Riley (Technical Institute, Rochdale).

Dr. Howarth (the Medical Officer of Health for the City of London) reports the arrival of two consignments of "COMPOUND LARD" from Holland—the first consisting of 250 cases, and the second of 100. Samples were taken, and the lard was found to contain from 80 to 90 per cent. of cottonseed oil and the remainder of stearine. Dr. Howarth suggests that the use of the term "lard" in connexion with products not containing hog fat is pernicious, and should be prohibited and made illegal.

An important oil-firing installation has just been put into operation for the largest OIL REFINERY in this country—that of The Shell Mex Co., at their Shell Haven Wharf. The plant, which has been installed by the Clyde Oil Fuel System Co., of Galsgow (the sole licensees and manufacturers being Messrs. Alexander Stephen & Sons, of Linthouse), is for steaming a battery of Lancashire boilers, supplying the total power for Shell Haven. These boilers were converted from coal to oil burning without any structural alteration.

Mr. W. C. Bridgeman, Secretary for Mines, announces that in accordance with the provisions of Section 4 of the Mining Industry Act, 1920, he has appointed the following to serve on the Advisory Committee for the Metalliferous Mining industry : Sir Cecil Lindsay Budd (chairman); Brig.-General G. M. Jackson, Messrs. Myles Kennedy, S. J. Lloyd, Claud Edward Pease ; Harry Dack, T. Gavan-Duffy, William Lewney, W. Sherwood ; R. Arthur Thomas ; Joseph Harris ; Anthony Wilson ; James Wignall, M.P. ; Thomas Falcon, F. H. Hatch, Frank Merricks ; Frank William Harvord ; T. C. F. Hall, Professor Henry Louis, Dr. James Malcolm Maclaren ; Mr. J. J. Burton ; Sir Kenneth Weldon Goadby ; and Mr. F. C. Starling, of the Mines Department, will act as secretary to the Committee. Arrangements are being made to hold the first meeting of the Committee as soon as the present emergency in connexion with the coal-mining industry is past.

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Patent Literature

Abstracts of Complete Specifications

162,303. ALUMINIUM HYDROXIDE, PROCESS FOR THE PRODUCTION OF. M. Buchner, 1, Schellingstrasse, Hannover-Kleefeld, Germany. Application date, November 28, 1917.

The object is to obtain aluminium hydroxide by precipitation of aluminium salts with ammonia, free from contamination with complex compounds of the aluminium salt. It has been found that if a concentrated solution of ammonia be added to the aluminium salt in equivalent quantity, the precipitate contains 10 to 15 per cent. of SO_3 and about 4 per cent. of NH_3. Pure aluminium hydroxide may be obtained by using a very large excess of ammonia in the form of highly concentrated or super-concentrated solution, up to about five times the equivalent amount. If gaseous ammonia be used, eight times the equivalent quantity may be employed. The aluminium salt may be used dry, or in solution.

162,314. AMMONIA FROM GASES, EXTRACTION OF. E. L. Pease, Hurworth Moor, Darlington, Durham. Application date, October 29, 1919.

Sulphate of ammonia is obtained by the absorption of ammonia from gases, in a dry material containing aluminium sulphate, without the use of sulphuric acid. The aluminium sulphate is produced by burning or heating sulphur and shale or aluminous matter, or sulphur bearing shale, or sulphur and clay. The sulphur may be added in the form of lime or iron oxide which has been used for purifying gas. The resulting ash absorbs ammonia with the formation of dry ammonium sulphate, and the product is suitable for use as a fertiliser.

162,337. RECOVERY OF OIL FROM SUBSTANCES SUCH AS BITUMEN AND SHALE *in situ*. D. Diver, 1648, Third Avenue, S.W., Calgary, Canada. Application date, December 23, 1919.

A bore hole is made in oil-bearing strata, a casing is inserted into it, and an electric heating element is placed in a suitable position in the casing. The casing is perforated to allow oil to enter and the more volatile portion is vaporised and drawn off by a pipe at the top to a condenser. The less volatile portion is rendered more liquid and may be pumped with greater facility.

162,370. CONTINUOUS HYDROGENATION OF UNSATURATED OILS, FATS AND THE LIKE, PROCESS FOR. E. R. Bolton, 4, Milner Street, London, S.W.3. Application date, January 26, 1920.

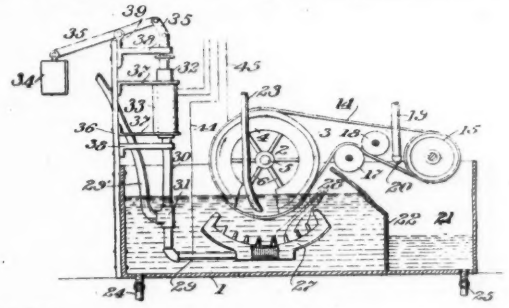
The process is for obtaining an increased activity of the nickel catalyst used in the hydrogenation of oils and fats. Fine nickel wool is treated with nitric acid in liquid or vapour form, and the nickel salt thus produced on its surface is converted into oxide by roasting. The oxide is then reduced to metallic nickel by hydrogen. The reaction is effected in a long vessel through which oil and hydrogen are forced in opposite directions at such a rate that oil hydrogenated to any required amount may be withdrawn continuously. To restore the activity of the catalyst, it may be treated *in situ* with hot oil which removes metallic soaps. The wool may then be treated with oil solvents and heated in hydrogen till its activity is restored.

162,382. HYDROGENATION OF OILS, FATS AND THE LIKE, METHOD OF MAINTAINING THE ACTIVITY OF METALLIC CATALYSTS IN. E. R. Bolton and E. J. Lush, 4, Milner Street, London, S.W.3. Application date, January 27, 1920.

Nickel catalyst which has been used in the hydrogenation of oils and fats is found to be coated with metallic soaps due to the presence of free fatty acids in the oil, or to splitting of the oil by the nickel oxide in the presence of moisture. It is found that the activity of the catalyst may be prolonged and the formation of metallic soaps prevented by the presence of mono or di-glycerides of fatty acids during hydrogenation of neutral oil. These should be added in quantity equivalent to the fatty acids which are known to be formed during hydrogenation. The colour, taste, and smell of the hydrogenated oil is also improved. Oils containing free fatty acids may be hydrogenated as readily as neutral oils by adding mono- or di-glycerides sufficient to combine with the free fatty acids. Details are given of the hydrogenation of cotton seed oil containing free fatty acid.

162,390. SEPARATING SUSPENDED MATTER FROM LIQUIDS, PROCESS AND APPARATUS FOR. A. F. Meston, 63, Wall Street, New York. Application date, January 28, 1920.

The apparatus is for continuously filtering a liquid containing finely divided suspended matter or colloidal matter. A drum 2 is constructed of material which is an electrical conductor and has a permeable rim 3 and lateral flanges 4 which extend radially inward. The drum is mounted by central radial spokes 6 on a shaft 5, which may be continuously rotated. An endless belt 14 of fibrous material passes over the drum 2 and pulleys 15, 17, 18. The liquid is supplied by pipes 29', 29, and distributing device 27, 28, which are carried by a rod 30 of insulating material which is attached to a plunger 32 within a solenoid 33. The weight of these parts is balanced by a weight 34 suspended from a lever 35. The solenoid is connected



162,390.

in circuit with an alternator, the primary of a transformer, and the driving motor. The secondary of the transformer is connected to the member 27 and to the drum 2 so that a potential difference is maintained between the two. The liquid is projected upwards towards the belt 14 and the high-frequency current produces a migration and agglomeration of the suspended particles. The drum 2 dips into the liquid to such an extent that no overflow takes place into the inner channel, and the filtered liquid passes through the belt 14 and rim 3 to that channel and is withdrawn by suction through a pipe 23. The deposit on the belt is compressed between the rollers 17, 18 to remove excess of liquid, and is cleaned by a jet of liquid from the pipe 19 which discharges into a separate vessel 21. The filtering process is automatically kept substantially uniform by the solenoid 33 which lowers the nozzles 28 when the current between the electrodes 2, 27 increases. The same increase of current also increases the speed of the motor and consequently the speed of the belt 14 so that the chains of agglomerated particles which form between the electrodes are broken up.

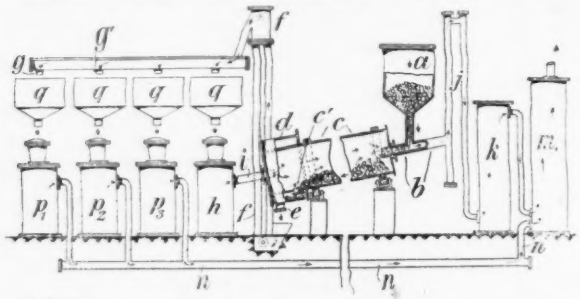
162,429. CAOUTCHOUC, PROCESS FOR THE VULCANISATION OF, S. J. Peachey, 5, Yew Tree Road, Davenport, Cheshire. Application date, February 12, 1920. Addition to 129,826.

Specification 129,826 describes a vulcanisation process in which rubber, either solid or in solution, is treated alternately with sulphur dioxide and hydrogen sulphide without heating. It is now found that the vulcanisation is accelerated if either or both of the gases is or are applied at a pressure above atmospheric.

162,459. CONTINUOUS PRODUCTION OF SOLID AND GASEOUS FUEL, WITH BY-PRODUCT RECOVERY, PROCESS AND PLANT FOR. H. Nielsen, 13, Firs Avenue, Muswell Hill, London, N.10, and J. R. Garrow, 30, Vineyard Hill Road, Wimbledon, London, S.W.19. Application date, February 23, 1920.

Carbonaceous material is subjected to low-temperature distillation by the sensible heat of producer gas and water

gas as distinguished from the heat of combustion. The raw material is fed from a hopper *a* to an inclined rotary retort *c* which is provided with a fixed annular casing *d* surrounding the lower end. The coked residue falls through the opening *c'* into the casing *d* and is discharged at the outlet *e* into a



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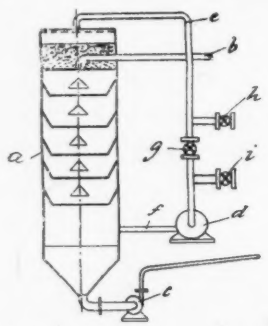
hopper from which it is raised by a conveyor *f*. The residue is distributed by the shoots *g* to hoppers *q* and thence to gas producers p_1, p_2, p_3, and *h*. Gas from the producer *h* only is used for heating the retort *c*, and is supplied by the pipe *i*. The mixed producer gas and products of distillation from the retort pass by a passage *b* to a condenser *j*, and thence to an absorption apparatus *k* where hydrocarbons are retained. The gas then passes to an ammonia saturator *m*. Gas from the producers p_1, p_2, p_3 passes to a main *n* and thence to the saturator *m*. The employment of a limited quantity of producer gas for the distillation prevents excessive dilution of the distillation products and consequently avoids the passage of large quantities of gas through the tar-oil condensers and oil washers.

162,554. REMOVAL OF SULPHUR FROM GASES. N. E. Rambush, Parkfield Works, Stockton-on-Tees. Application date, May 21, 1920.

Sulphided material which has been used for purifying gases from sulphur may be revivified by treating it with air, but this involves a loss of sulphur, and the object is to avoid this loss by circulating the air in a closed cycle. The sulphided suspended material is supplied by a pipe *b* to a tower *a*, and air is admitted at the bottom by a pipe *f*. The air is withdrawn at the top through a pipe *e* and returned through a valve *g* to the pump *d*. The amount of oxygen in the air may be reduced to 8 per cent. without rendering the process



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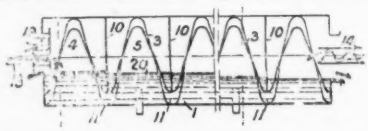
uneconomical, and the loss of sulphur is only 1 per cent. of that incurred when air is passed only once through the material. By adjusting the opening of the valves *g*, *h*, *i*, a small proportion of air may be allowed to escape through the valve *h* and a small proportion of fresh air may be drawn in through the valve *i*. In a modification the air is not circulated but is slowly drawn through the suspended material by providing the outlet with a vertical pipe which induces a natural draught. The oxygen content of the air is reduced to the desired amount when it reaches the outlet.

NOTE.—The following specifications which are now accepted were abstracted in THE CHEMICAL AGE when they became open to inspection under the International Convention :—138,115 (V. Schwarzkopf), relating to refining oils and fats, *see* Vol. II., p. 385 ; 138,129 (American Coke & Chemical Co.) relating to ammonia saturators, *see* Vol. II., p. 385 ; 140,083 (Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude), relating to enclosures for reactions taking place under high temperatures and pressures, *see* Vol. II., p. 562 ; 145,036-7 (Badische Anilin & Soda Fabrik), relating to fertilisers, *see* Vol. III., p. 342 ; 147,020 (Manufacture de Produits Chimiques du Nord Etablissements Kuhlmann), relating to removing dust from furnace gases, *see* Vol. III., p. 362 ; 148,763 (Sudfelt & Co.), relating to salts of sulpho acids from lignite tar oils, *see* Vol. III., p. 517.

International Specifications not yet Accepted

161,159. LEACHING APPARATUS. Soc. Generale d'Evaporation Procédés Prache et Bouillon, 106, Boulevard Haussmann, Paris. International Convention date, March 30, 1920.

Solid material to be leached is supplied by a worm 14 to a horizontal rotary cylinder 1 divided into compartments 4, 5 . . . by partitions 10. Each partition has an opening 11



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for the passage of a helical strip 3. The leaching liquid is delivered by a pipe 19 and its level 20 in successive compartments is lower, due to partial obstruction of the openings 11 by solid matter. The liquid and solid pass through in opposite directions.

161,161. AMMONIUM CHLORIDE. O. L. Christenson, 36B, Karlbergsvagen, Stockholm, and B. A. Hedman, 59, Ostermalmsgatan, Stockholm. International Convention date, March 27, 1920. Addition to 159,817.

Specification 159,817 (*see* THE CHEMICAL AGE, Vol. IV. p. 567) describes a process for distilling a mixture of coal, an alkali or alkaline earth chloride, and silica, to obtain ammonium chloride. This process may also be applied to the distillation of alum slate or other bituminous slate or shale.

161,165. MAGNESIUM CHLORIDE. V. M. Goldschmidt, 23, Trondhjemsveien, Christiania. International Convention date, March 29, 1920.

Magnesia, magnesium carbonate, magnesium sulphate, or the double calcium-magnesium carbonate or silicate, is converted into anhydrous magnesium chloride by heating with chlorine in the presence of sulphur or sulphur chloride. When the chlorination is effected at about 300°C., a small proportion of magnesium sulphate is produced, and this is converted into magnesia by adding carbon. The temperature is not raised above 700°C., to avoid fusion of the product. The process may be combined with the electrolysis of, magnesium chloride, and the chlorine from the latter is used in the chlorination process.

161,195. AMMONIA. L'Air Liquide, Soc. Anon. pour l' Etude et l'Exploitation des Procédés G. Claude, 48, Rue St. Lazare, Paris. International Convention date, April 7, 1920.

The reaction tube used for the synthesis of ammonia under very high pressures is surrounded by a heat-insulating material to prevent stress in the walls due to temperature differences. The heat generated in the reaction may be removed by the progressive addition of cold gas to the partly used gases. Alternatively, the inner layers of the reaction tube may be made of viscous metal and the outer layers of non-viscous metal, or metal strengthening bands may be used.

LATEST NOTIFICATIONS.

163,323. Preparation of hydrogen and ammonia. Nitrogen Corporation. May 14, 1920.

163,330. Process for the manufacture of nitrate of calcium. Aluminium-Industrie Akt-Ges. May 19, 1920.

163,685. Process for distilling sulphuric acid. Chemische Fabrik Weissenstein Ges. May 21, 1920.

163,693. Process for the production of basic steel. Soc. Anon. Usines Metallurgiques de la Basse-Loire. May 18, 1920.

Specifications Accepted, with Date of Application

139,159. Liquids, Purification of. Koppers Co. February 15, 1919.
140,061. Catalysts, Process for the production of—and the product thereof. L. Duparc and C. Urfer. March 13, 1919.
143,545. Destructive distillation of wood. E. M. Sawtelle. September 10, 1918.
145,060. Urea, Manufacture and production of. Badische Anilin & Soda Fabrik. August 9, 1916.
155,792. Zinc, Recovery of—by electrolysis. Electrolytic Zinc Co. of Australasia Proprietary, Ltd. December 24, 1919.
163,064. Grinding, crushing or disintegrating machines. C. E. V. Hall. June 25, 1920.
163,095. Gas purifiers. Firth, Blakeley, Sons & Co., Ltd., and W. Blakeley. February 9, 1920.
163,116. Crystallisation of solutions, Receptacles for use in connection with. F. Merz. February 11, 1920.
163,137. Artificial manures. O. Silberrad. February 19, 1920.
163,150. Vertical retort setting for the destructive distillation of coal and the like. S. Glover, J. West, and West's Gas Improvement Co., Ltd. February 24, 1920.
163,162. Ammonium salts, Purification of. G. B. Ellis (*Foundation Oven Corporation*). March 1, 1920.
163,173. Crude oil, or the like, Refining—by distillation. J. G. P. Evans. March 9, 1920.
163,199. Coal tar, blast-furnace tar, and like tars, Distillation of —and the treatment of the residual pitches. H. Tindale. April 20, 1920.
163,210. Hydrogen and zinc oxide, Process of making. R. H. McKee. May 17, 1920.

Applications for Patents

Agra Engineering Co., Ltd., & Parkhouse, W. R. Machines for distributing artificial manures, fertilisers, &c. 14,589. May 25.
Blair, Campbell & McLean, Ltd. Apparatus for effecting intimate contact of liquids and gases. 12,873. May 5.
Bolton, E. R. Method for recovery of oil from and purification of Fuller's earth, charcoal, &c., for re-use in oil-refining. 14,413. May 24.
Bowler, L. P. Decorticating-machine and chemical apparatus for treatment of palm fibres. 14,374. May 24.
Boyd, A. J. Means for measuring or indicating weights of given volumes of liquids. 14,551. May 25.
Bradley, L., Glossop, W. and Willsdon, R. W. Distillation of tar, &c. 12,524. May 2.
Budde, C. C. L. G. Manufacture of hydro-oxy-cellulose, a new xanthogenated compound therefrom, &c. 14,852. May 28.
Chemische Fabrik Griesheim-Elektron and Sachy, R. Process for electrolytic production of potassium carbonate from potassium chloride solutions. 12,573. May 2.
Duckham, Sir A. M. Carbonising fuel in vertical retorts. 12,675. May 3.
Hawes, J. Alcohol fuel. 14,781. May 27.
Hendon Paper Works Co. Manufacture of hydra-oxy-cellulose, a new xanthogenated compound therefrom, &c. 14,852. May 28.
Jullien, M. A. Manufacture of metal tubes by electrolytic deposition. 12,810. May 4.
Lefebvre, C. Process for obtaining an oil having the chemical properties of essence of turpentine. 13,160. May 9.
Leprestre, R. Apparatus for catalytic synthesis of amm via. 14,459. May 24.
Liese, H. (Firm of). Apparatus for measurement of gases, vapours, and liquids. 13,016. May 6. (Czecho-Slovakia, May 6, 1920.)
Loke, J. J. Process for direct production of titanic-iron ores or slags. 14,813. May 27.
Lush, E. J. Method for recovery of oil from and purification of Fuller's earth, charcoal, &c., for re-use in oil-refining. 14,413. May 24.
Marshall, F. D. Retorts for treatment of carbonaceous, &c., materials. 14,472. May 24.
Nitrogen Corporation. Catalyst, and method of preparing same. 13,161. May 9. (United States, May 8, 1920.)
,, Preparation of gas mixtures and ammonia. 13,162. May 9. (United States, May 8, 1920.)
Norris, W. H. H. Process for recovering sodium sulphate and a liquor of high acidity from nitre-cake. 13,029. May 7.
Oehlrich, F. J. G. Process for production of a contact mass for catalytic synthesis of ammonia. 13,656. May 13.
Owen, W. Production of metallic dust. 13,018. May 6.
Poore, P. Destructive distillation of wood, &c. 14,820. May 27.
Schülke, E. Production of artificial multiple-filament threads from cellulose solution. 13,592. May 13. (Germany, May 17, 1920.)
Smaill, A. E. Process for producing an alloy. 13,158. May 9.
Wardall, F. C. Aluminium alloys. 14,544. May 25.
Wilton, N. Manufacture of sulphate of ammonia. 13,261. May 10.

Breach of Contract Claim

ON June 2, in the King's Bench Division, Mr. Justice Rowlatt heard a motion for judgment on behalf of Mr. Luke Harrison, trading as H. Harrison & Co., of Regent Road, Salford, in an action for breach of contract, against Mr. R. E. Pemberton, of Creed Lane, Ludgate Hill, E.C. Counsel for the plaintiff said the contract was for the delivery by the defendant of 50 tons of salt cake, 95 per cent. ground, f.o.b. London, June, 1920, delivery, at £19 10s. per ton. Defendant agreed to indemnify the plaintiff against any claim that might arise in consequence of the goods not being in accordance with the contract. They, in fact, turned out utterly useless; the sub-purchaser repudiated, and there was a claim of repudiation from other sub-purchasers. The defence to the action had been ordered to be struck out.

His Lordship said the plaintiffs would have judgment for damages for a sum to be assessed by a Master, and a declaration without terms of the indemnity.

Seizure of Pyrogallic Acid

IN the Court of Appeal on May 10, Lords Justices Bankes, Warrington and Scrutton by consent allowed an appeal (upon terms not stated) by the Crown against a judgment of Mr. Justice Sankey, delivered on December 7, 1919. (*See* THE CHEMICAL AGE, Vol. I., page 721.) The suit was by the Crown, by information, for the condemnation of six packages of pyrogallic acid consigned to and imported into Manchester by the Defendant, Mr. John Brown, trading as Brown & Forth, chemical manufacturers, of Manchester and London. The goods were seized on August 29, 1919, under a Proclamation dated June 25, 1919. Mr. Justice Sankey held that the Proclamation was illegal and invalid and entered judgment for the defendant with costs. The Attorney-General now stated that the case was met by Section 4 of the Indemnity Act, 1920, and counsel for the defendant intimated that he could not contest that proposition.

Chemists as Golfers

THOSE of our readers who are devotees of the "Royal and Ancient" game of golf will be interested to learn that we have received from the Royal Insurance Co., Ltd., a revised edition of their Rules of Golf booklet. In addition to a comprehensive index, it contains an inset showing the differences between the old Rules and the new (as amended in September last), together with a few facts relating to the rubber core ball. The company informs us that so far as the stock will permit they will be pleased to forward a copy to any reader of THE CHEMICAL AGE on application to their head offices at North John Street, Liverpool, or Lombard Street, London.

Patents Court Cases

AN application has been made, under Sect. 20 of the Patents and Designs Acts, 1907 and 1919, for the restoration of Patent No. 6,900 of 1914, which lapsed on March 18, 1919. This patent is in the name of R. B. Ransford (from L. Casella & Co. Ges.), and relates to a trisazo dyestuff.

The following patents have been endorsed "Licences of Right" under Sect. 24 of the Acts: 20,794/1910 (C. Bayer), relating to purifying and cooling gas; 1,134/1911 and 14,612/1911 (S. E. Sieurin), relating to reduction of ores; 7,469/1915 (E. J. Sweetland), relating to a filter medium.

Storage of High Explosives

IN asking for a sum of £94,000 to make provision for the STORAGE OF HIGH EXPLOSIVES, Commander Eyres-Monsell, Civil Lord of the Admiralty, reminded the House of Commons last week that during the war accommodation had to be found in a hurried manner for a great many high explosives, and undoubtedly many risks were taken. In this connexion he recalled the disastrous explosions at Silvertown and Halifax. At Silvertown in January, 1917, 53 tons of T.N.T. were detonated, with the result that 73 men were killed, 900 injured, and a large amount of destruction was done to property. The disaster at Halifax was much more serious, 2,600 tons of high explosives being detonated, with a death-roll of 2,000.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The weekly report contains only commodities whose values are at the time of particular interest or of a fluctuating nature. A more complete report and list are published once a month. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

Market Report

THURSDAY, June 2.

THERE is little improvement to report in market conditions since last week. Trade generally is almost at a standstill, and such buying as exists is of the hand-to-mouth variety.

As we mentioned last week, stocks, however, appear to be very limited, and a shortage is not unlikely when business re-opens.

There has been a certain improvement in export enquiry which it is hoped will lead to a better outflow of commodities at an early date.

General Chemicals

ACETONE has been in strong enquiry for export, and is again firmer in tone.

ACID ACETIC is only in small enquiry; price nominally unchanged.

ACID CITRIC is particularly firm, and only limited quantities are available for early delivery.

ACID FORMIC is lifeless.

ACID LACTIC has been in some enquiry, and the price is hardening.

ACID TARTARIC.—The maker's price has been reduced to the level of secondhand offerings, but it seems difficult to stimulate demand.

BARIUM CHLORIDE is rather easier on foreign offering.

BLEACHING POWDER.—The market remains quite stagnant.

COPPER SULPHATE is unchanged.

FORMALDEHYDE is again lower on realisation of stocks; the demand is only very moderate.

LEAD ACETATE.—No transactions of any importance are indicated, but the price is nominally without alteration.

LEAD NITRATE.—Unchanged; turnover nominal.

POTASH BICHROMATE is still a drug on the market, and within limits buyers can name their own price.

POTASH CARBONATE remains uninteresting.

POTASH CAUSTIC.—There has been a little better enquiry, but the price continues in buyers' favour, and the volume of business reported is exceedingly small.

POTASH PERMANGANATE.—Small business is reported at recent figures.

POTASH PRUSSIATE is decidedly firmer, and the stocks held on this side are nominal.

SODA ACETATE is rather lower in price, and no business can be detected.

SODA BICHROMATE.—Orders have been on the market, but the limits are regarded as impracticable, even by second-hand holders.

SODA CAUSTIC.—Little or no business is passing; price nominally unchanged.

SODA HYPOSULPHITE.—There is limited buying against seasonal requirements. The price is firm.

SODA NITRATE.—There is no change.

SODA PHOSPHATE is in small enquiry and the price has an easy tendency.

SODA PRUSSIATE is distinctly firmer in price, and second-hand parcels have mostly been absorbed.

SODA SULPHIDE.—Unchanged.

Coal Tar Intermediates

There is little change to report under this heading. Since our last report still more of the consumers' and producers' works have been shut down owing to lack of coal, with the obvious result on business.

ALPHANAPHTHYLAMINE.—A slightly better demand has been experienced, but little business has been actually placed.

ANILINE OIL AND SALT.—Enquiry is better, and some business has been done in oil at recent values.

BETA NAPHTHOL has been in slightly better enquiry.

DIPHENYLAMINE.—Price is maintained, but little business is actually reported.

NITROBENZOL remains in steady demand at slightly easier value.

NAPHTHIONIC ACID is in small demand.

PARANITRANILINE is in slightly better demand, and price is maintained.

SALICYLIC ACID continues in request at recent quotations.

Coal Tar Products

There is very little business in coal tar products owing to the continued coal strike.

90's BENZOL has been reduced in price owing to the fall in petrol, and is nominally quoted at 2s. 6d. per gallon on rails in the North and 2s. 7d. in the South. As a matter of fact, there is practically no British benzol available on the market.

PURE BENZOL is quoted at 2s. 10d. to 3s. in the North and 3s. to 3s. 2d. in the South.

CREOSOTE OIL is in poor demand, and there are several sellers in the market at 8d. to 8½d. in the North and 9½d. to 10d. in the South.

CRESYLIC ACID is still very weak, the price for Pale being 97/99 per cent., being in the region of 2s. to 2s. 3d., and Dark 95/97 per cent., 1s. 11d. to 2s.

SOLVENT NAPHTHA is scarce and is quoted at 2s. 6d. per gallon on rails.

HEAVY NAPHTHA is worth from 2s. 3d. to 2s. 4d.

NAPHTHALENE is inactive, and is worth from £8 to £12 for Crude qualities, while Refined qualities are being quoted from £18 to £23 per ton.

Current Prices

Chemicals

	per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	2	3	to	0	2	6
Acetone oil	ton	95	0	0	to	100	0	0
Acetone, pure	ton	105	0	0	to	110	0	0
Acid, Acetic, glacial, 99-100%	ton	70	0	0	to	72	0	0
Acetic, 80% pure	ton	53	0	0	to	54	0	0
Arsenic	ton	100	0	0	to	105	0	0
Boric, cryst	ton	69	0	0	to	70	0	0
Carbolic, cryst. 39-40%	lb.	0	0	6	to	0	0	6½
Citric	lb.	0	2	7	to	0	2	9
Formic, 80%	ton	77	0	0	to	80	0	0
Gallic, pure	lb.	0	4	0	to	0	4	3
Hydrofluoric	lb.	0	0	8½	to	0	0	9
Lactic, 50 vol.	ton	37	10	0	to	40	0	0
Lactic, 60 vol.	ton	42	10	0	to	45	0	0
Nitric, 80 Tw.	ton	41	0	0	to	44	0	0
Oxalic	lb.	0	0	10	to	0	0	11
Phosphoric, 1.5	ton	55	0	0	to	57	0	0
Pyrogallic, cryst	lb.	0	8	0	to	0	8	3
Salicylic, Technical	lb.	0	1	0	to	0	1	2
Salicylic, B.P.	lb.	0	1	5	to	0	1	7
Sulphuric, 92-93%	ton	8	10	0	to	8	15	0
Tannic, commercial	lb.	0	3	6	to	0	3	9
Tartaric	lb.	0	1	9	to	0	1	10
Alum, lump	ton	18	0	0	to	18	10	0
Alum, chrome	ton	45	0	0	to	50	0	0
Alumino ferric	ton	9	0	0	to	9	10	0
Aluminium, sulphate, 14-15%	ton	15	0	0	to	16	0	0
Aluminium, sulphate, 17-18%	ton	18	0	0	to	19	0	0
Ammonia, anhydrous	lb.	0	2	2	to	0	2	4
Ammonia, .880	ton	43	0	0	to	45	0	0
Ammonia, .920	ton	30	0	0	to	32	10	0
Ammonia, carbonate	lb.	0	0	4	to		—	
Ammonia, chloride	ton	65	0	0	to	70	0	0
Ammonia, muriate (galvanisers)	ton	50	0	0	to	52	0	0
Ammonia, nitrate	ton	55	0	0	to	60	0	0
Ammonia, phosphate	ton	95	0	0	to	100	0	0
Ammonia, sulphocyanide	lb.	0	3	0	to	0	3	0
Amyl acetate	ton	420	0	0	to	425	0	3
Arsenic, white, powdered	ton	52	0	0	to	55	0	0

	per	£	s.	d.		£	s.	d.
Barium, carbonate, 92-94%	ton	12	10	0	to	13	0	0
Barium, chlorate	lb.	0	0	11	to	0	1	0
Chloride	ton	20	0	0	to	21	0	0
Nitrate	ton	50	0	0	to	52	0	0
Barium Sulphate, blanc fixe, dry	ton	30	0	0	to	31	0	0
Sulphate, blanc fixe, pulp	ton	16	10	0	to	17	0	0
Sulphocyanide, 95%	lb.	0	1	6	to	0	1	0
Bleaching powder, 35-37%	ton	20	0	0	to	21	0	0
Borax crystals	ton	34	0	0	to	36	0	0
Calcium acetate, Brown	ton	12	0	0	to	13	0	0
,, Grey	ton	19	0	0	to	21	0	0
Calcium Carbide	ton	29	0	0	to	30	0	0
Chloride	ton	12	10	0	to	13	0	0
Carbon bisulphide	ton	65	0	0	to	67	0	0
Casein, technical	ton	90	0	0	to	92	0	0
Cerium oxalate	lb.	0	3	9	to	0	4	0
Chromium acetate	lb.	0	1	2	to	0	1	4
Cobalt acetate	lb.	0	11	6	to	0	12	6
Oxide, black	lb.	0	16	0	to		—	
Copper chloride	lb.	0	1	3	to	0	1	6
Sulphate	ton	35	0	0	to	37	0	0
Cream Tartar, 98-100%	ton	130	0	0	to	135	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde 40% vol.	ton	103	0	0	to	105	0	0
Formusol (Rongalite)	lb.	0	4	9	to	0	5	1
Glauber salts, commercial	ton	6	0	0	to	7	0	0
Glycerine, crude	ton	70	0	0	to	72	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	8	to	0	2	9
Iron perchloride	ton	45	0	0	to	50	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	50	0	0	to	52	0	0
Carbonate (White Lead)	ton	43	0	0	to	46	0	0
Nitrate	ton	55	0	0	to	57	0	0
Litharge	ton	38	10	0	to	40	0	0
Lithopone, 30%	ton	30	0	0	to	32	10	0
Magnesium chloride	ton	18	0	0	to	19	0	0
Carbonate, light	cwt.	2	15	0	to	3	0	0
Sulphate (Epsom salts commercial)	ton	10	10	0	to	11	10	0
Sulphate (Druggists')	ton	18	10	0	to	19	10	0
Manganese, Borate	ton	70	0	0	to	75	0	0
Sulphate	ton	75	0	0	to	78	0	0
Methyl acetone	ton	95	0	0	to	100	0	0
Alcohol, 1% acetone	ton	145	0	0	to	150	0	0
Nickel sulphate, single salt	ton	60	0	0	to	62	0	0
Nickel ammonium sulphate, double salt	ton	62	0	0	to	64	0	0
Potash, Caustic	ton	42	0	0	to	45	0	0
Potassium bichromate	lb.	0	0	9½	to		—	
Carbonate, 90%	ton	50	0	0	to	55	0	0
Chloride	ton	38	0	0	to	40	0	0
Chlorate	lb.	0	0	8½	to	0	0	9
Meta bisulphite, 50-52%	ton	130	0	0	to	140	0	0
Nitrate, refined	ton	50	0	0	to	52	0	0
Permanganate	lb.	0	2	0	to	0	2	3
Prussiate, red	lb.	0	2	6	to	0	2	9
Prussiate, yellow	lb.	0	1	6	to	0	1	7
Sulphate, 90%	ton	31	0	0	to	33	0	0
Salammoniac, firsts	cwt.	3	15	0	to		—	
Seconds	cwt.	3	10	0	to		—	
Sodium acetate	ton	35	0	0	to	37	10	0
Arsenate, 45%	ton	60	0	0	to	62	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	7½	to	0	0	8
Bisulphite, 60-62%	ton	35	0	0	to	37	10	0
Chlorate	lb.	0	0	5½	to	0	0	5½
Caustic, 70%	ton	24	0	0	to	24	10	0
Caustic, 76%	ton	25	0	0	to	25	10	0
Hydrosulphite, powder, 85%	lb.	0	2	3	to	0	2	6
Hyposulphite, commercial	ton	22	0	0	to	24	0	0
Nitrite, 96-98%	ton	48	0	0	to	50	0	0
Phosphate, crystal	ton	25	0	0	to	27	0	0
Perborate	lb.	0	1	9	to	0	2	0
Prussiate	lb.	0	0	8	to	0	0	8½
Sodium Sulphide, crystals	ton	19	0	0	to	20	0	0
Sulphide, solid, 60-62%	ton	26	0	0	to	30	0	0
Sulphite, cryst.	ton	15	0	0	to	16	0	0
Strontium carbonate	ton	85	0	0	to	90	0	0
Strontium Nitrate	ton	84	0	0	to	90	0	0
Strontium Sulphate, white	ton	8	10	0	to	10	0	0
Sulphur chloride	ton	42	0	0	to	44	10	0
Sulphur, Flowers	ton	19	0	0	to	19	10	0
Roll	ton	19	0	0	to	19	10	0
Tartar emetic	lb.	0	2	3	to	0	2	6
Tin perchloride, 33%	lb.	0	2	6	to	0	2	7
Tin Perchloride, solid	lb.	0	3	0	to	0	3	3
Protochloride (tin crystals)	lb.	0	1	8	to	0	1	9
Zinc chloride, 102 Tw.	ton	22	0	0	to	23	10	0
Chloride, solid, 96-98%	ton	60	0	0	to	65	0	0

Coal Tar Intermediates, &c.

	per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	4	0	to	0	4	3
Alphanaphthol, refined	lb.	0	4	6	to	0	4	9
Alphanaphthylamine	lb.	0	3	0	to	0	3	3
Aniline oil, drums extra	lb.	0	1	7	to	0	1	8
Aniline salts	lb.	0	1	8	to	0	1	10
Anthracene, 85-90%	lb.		—		to		—	
Benzaldehyde (free of chlorine)	lb.	0	4	9	to	0	5	0
Benzidine, base	lb.	0	8	6	to	0	9	0
Benzidine, sulphate	lb.	0	9	0	to	0	9	6
Benzoic acid	lb.	0	2	3	to	0	2	6
Benzoate of soda	lb.	0	2	3	to	0	2	6
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	8	0	to	0	8	6
Betanaphthol	lb.	0	2	9	to	0	3	0
Betanaphthylamine, technical	lb.	0	9	6	to	0	10	0
Croceine Acid, 100% basis	lb	0	5	0	to	0	6	3
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	6	9	to	0	7	6
Dinitrobenzol	lb.	0	1	5	to	0	1	6
Dinitrochlorbenzol	lb.	0	1	5	to	0	1	6
Dinitronaphthaline	lb.	0	1	6	to	0	1	8
Dinitrotoluol	lb.	0	1	8	to	0	1	9
Dinitrophenol	lb.	0	3	0	to	0	3	3
Dimethylaniline	lb.	0	4	0	to	0	4	3
Diphenylamine	lb.	0	4	6	to	0	4	9
H-Acid	lb.	0	10	0	to	0	10	6
Metaphenylenediamine	lb.	0	5	9	to	0	6	0
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	7	6	to	0	8	0
Monosulphonic Acid (2:7)	lb.	0	7	6	to	0	8	0
Naphthionic acid, crude	lb.	0	4	0	to	0	4	3
Naphthionate of Soda	lb.	0	4	3	to	0	4	6
Naphthylamin-di-sulphonic-acid	lb.	0	5	0	to	0	5	6
Nitronaphthalene	lb.	0	1	5	to	0	1	6
Nitrotoluol	lb.	0	1	4	to	0	1	5
Orthoamidophenol, base	lb.	0	18	0	to	1	0	0
Orthodichlorbenzol	lb.	0	1	1	to	0	1	2
Orthotoluidine	lb.	0	2	3	to	0	2	6
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	12	6	to	0	13	0
Para-amidophenol, hydrochlor	lb	0	13	0	to	0	13	6
Paradichlorbenzol	lb.	0	0	7	to	0	0	8
Paranitraniline	lb.	0	4	3	to	0	4	6
Paranitrophenol	lb.	0	2	9	to	0	3	0
Paranitrotoluol	lb.	0	5	9	to	0	6	0
Paraphenylenediamine, distilled	lb.	0	13	6	to	0	14	6
Paratoluidine	lb.	0	7	6	to	0	8	0
Phthalic anhydride	lb.	0	3	9	to	0	4	0
Resorcin, technical	lb.	0	7	6	to	0	8	0
Resorcin, pure	lb.	0	6	9	to	0	7	0
Salol	lb.	0	3	6	to	0	3	9
Sulphanilic acid, crude	lb.	0	1	4	to	0	1	6
Tolidine, base	lb.	0	8	6	to	0	10	0
Tolidine, mixture	lb.	0	2	9	to	0	3	0

Reduced Price of National Benzole

THE National Benzole Co., Ltd., 30, Grosvenor Gardens, S.W.1, advise us that the price of "National Benzole" has been reduced by 6d. per gallon from May 30. The present prices are, therefore, as follows :—

	Wholesale. per gall.	Retail. per gall.
Deliveries in bulk (road or rail tank wagons)	2/5½	—
,, ,, 50-gallon drums	2/6	2/10½
,, ,, 2-gallon cans	2/7	2/11½

The retail price has been reduced 6½d. per gallon, which makes the price the same as No. 1 motor spirit.

Tenders Invited for Calcium Carbide

TENDERS are invited up to noon on July 15 by the Egyptian Postal Administration at Alexandria for the supply of 15,000 kilogrammes of calcium carbide for acetylene gas light plants. Quotations should comprise free storage at the sole risk of the contractor and free delivery (by periodical partial supplies during the year) at 62 railway or river stations specified. Representation by a resident local agent is necessary, but United Kingdom firms not represented may care to avail themselves of the services of firms with an Egyptian branch whose names can be obtained at the Department of Overseas Trade, 35, Old Queen Street, London, S.W. 1. A copy of the above mentioned specification is also available for inspection by United Kingdom manufacturers on application to the Enquiry Room of the Department.

Company News

DISTILLERS' FINANCE CORPORATION.—A dividend at the rate of 10 per cent. per annum, less tax, is announced on the ordinary shares.

CENTRIFUGAL SEPARATORS.—The balance-sheet as at March 31, 1921, shows a balance at debit of profit-and-loss account of £5,935.

PAN-AMERICAN PETROLEUM.—Quarterly dividends of 3 per cent. (actual) on the common "A" and "B" stocks are payable on July 11.

SANTA CATALINA NITRATE CO.—The directors announce an nterim dividend of 10 per cent. (2s. per share), less tax, payable June 20.

UNITED INDIGO & CHEMICAL CO.—A dividend at the rate of 5 per cent. on the preference shares for the six months ending June is announced.

MEXICAN PETROLEUM CO.—Quarterly dividends of 3 per cent. (actual) on the common stock are payable July 11, and 2 per cent. (actual) on the preferred stock is payable on July 1.

SOCIETE GENERALE DES HUILES DE PETROLE.—The Committee of the Stock Exchange has now given permission to deal in the shares of the Société Générale des Huiles de Pétrole, representing, as will be remembered, interests of the Anglo-Persian Oil Co. in France, who have subscribed 45 per cent. of the capital.

SALAR DEL CARMEN NITRATE SYNDICATE.—The gross profit for 1920, including transfer fees, totalled £84,558; less expenses incurred during stoppage January to March, 1920, £9,775; London office charges, interest and discount, £5,466; reserve for income tax and corporation profits tax, £23,380; net profit of £45,936; brought in, £8,479; total, £54,415. Further dividend of 15 per cent., making 20 per cent. for year, less tax; to reserve, £10,000; reduction of plant and machinery account, £5,000; forward, £8,615. Meeting, Winchester House, June 9, at 11.30 a.m.

BROKEN HILL PROPRIETARY, BLOCK 10.—According to a cabled advice from Melbourne the half-yearly meeting was held in Melbourne on May 30. Operations for the half-year to March 31 last have resulted in a net loss after providing for depreciation, of £18,800. Credit balance to profit and loss carried forward, £43,455. The assets show a surplus of £33,882; this does not include shares in other companies. Copies of the reports and accounts should be in the hands of shareholders on the London register about the end of next month.

LAGUNAS NITRATE CO.—The gross profit for the year 1920 including transfer fees, interest on investments, and bank deposits, amounted to £72,827. After deducting the usual administration charges and providing for income-tax and depreciation on investments, the net profit is £47,177. The directors announce a dividend of 4s. per share, free of tax, payable June 11, leaving to be carried forward £11,177. From January, 1920, to March of the current year a normal output of nitrate of soda was maintained, but the officina was closed at the end of the latter month, owing to the large accumulation of unsold stocks in the consuming markets. The extraction of raw material is, however, being proceeded with. Meeting, 27, Leadenhall Street, E.C., June 7, at 11 a.m.

CAPE EXPLOSIVES WORKS, LTD.—Application has been invited for the purchase of £1,000,000 Cape Explosives Works, Ltd., 7½ per cent. first mortgage debenture stock at 95 per cent. It is further intended to obtain authority for the creation and issue of further debenture stock not exceeding £250,000 ranking *pari passu* with the present issue, this further stock to be reserved for issue in South Africa. Interest will be payable half-yearly in January and July, and the whole of the issue will be redeemed by January 1, 1944, either by drawings at par in equal annual instalments, commencing January 1, 1925, or by purchase if the price is under par. The Company retains the right to repay at £103 the whole of the issue outstanding at any time on giving six months' notice. The subscription money will be payable as follows: 5 per cent. on application, 25 per cent. on acceptance, and 32½ per cent. on September 1 and November 3. The proceeds of the issue are needed for additional working capital to extend the operations of the Company, and to redeem advances made by the De Beers Consolidated Mines. The issue was oversubscribed, and the subscription list was closed on Monday afternoon.

ESPERANZA COPPER & SULPHUR CO.—For the year 1920 the output of pyrites was 71,176 tons, being 36,447 tons more than in 1919. The mine was shut down for ten weeks owing to a railway strike. The ore reserves as re-estimated at the end of the year, were 835,000 tons. Of copper precipitate 85 tons were produced, or 18 tons more than in 1919. Of pyrites 61,719 tons were dispatched from the mine to Huelva, being 22,062 tons more. The shipments at Huelva were 82,970 tons, being 48,974 tons more. Depreciation on a similar scale to last year has been written off. The working costs decreased, due to higher output, and the rate of Spanish exchange was better than in the previous year. The average price of B.S. copper was £90 19s. 8d., as compared with £104 5s. 4d. in 1919. Profit for year, £14,599, brought in £7,198; total, £21,797. A dividend of 5 per cent., less tax, payable June 30, is proposed, leaving to be carried forward £4,297. Meeting, 62, London Wall, E.C., June 9, at noon.

BRITISH OIL & CAKE MILLS, LTD.—At the twenty-third ordinary general meeting of the British Oil & Cake Mills, Ltd., held on Tuesday, Mr. J. W. Pearson (chairman and managing director) said the final dividend was less than had at one time been expected, but it must not be forgotten that £2,500,000 of ordinary share capital ranked for dividend in 1920, as against £1,250,000 in 1919. £25,000 had been added to the reserve account, and ample provision had been made for liabilities in respect of taxes and contingencies. The small balance of £4,800, being mortgage on the company's Rochester property, had been paid off, thus clearing the balance-sheet of that item.

The large amount of cash at bankers and in hand last year, £483,131, as against £73,922 this year, was accounted for by the issue of ordinary shares made at the time of closing the 1919 accounts, the bulk of the cash for which came in during the last two days of the period, and was subsequently utilised in paying off the loans which figured as a liability on the other side of the account. The figures relating to stocks and trade debtors were one-half about of what they stood at on December 31, 1919, owing almost entirely to the marked change in values that had taken place by the end of last year.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIALS.	REF. NO.
Trinidad ...	Chemicals	667
Chicago ...	Dry Carbonate of lead (dry white lead)	—
Egypt ...	Calcium carbide. Inquiries to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.	—

Tariff Changes

FRANCE.—The prohibition on the export and re-export of glucose from France except under licence has been withdrawn.

FEDERATED MALAY STATES.—A 2½ per cent. *ad valorem* duty has been imposed on the export of china clay or Kaolin, and potash-felspar or soda-felspar intended for use as a flux or glaze.

JAMAICA.—Explosives other than industrial explosives may only be exported to the United Kingdom and British Possessions and Protectorates.

NETHERLANDS.—The prohibition on the exportation of ferruginous earth containing sulphur and potassium salts is withdrawn.

SPAIN.—A supplement to the *Board of Trade Journal* of May 26 gives the text of a new provisional Customs tariff. Many drugs, colours, dyes, varnishes, mineral fertilisers and other chemical products are affected.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette

Bankruptcy Information

BROOKS, T. C. (trading as R. Cheetham & Co)., 25 and 54, George Street, and 4, Chorlton Street, Manchester, Lancaster, chemist and analyst. Receiving order May 24, 1921. No. of Receiving Order, 33, Creditors' Petition.

Order Made on Application for Discharge

LEEK, S. J., 17, Solon New Road, Clapham, London, carrying on business in co-partnership with Thomas Wilkie, as E. Leek & Co., formerly at 1, Falcon Grove, Battersea, and now 35, Bedford Road, Clapham, Surrey, Manufacturing Chemist. High Court of Justice, April 26, 1921.

Companies Winding Up

ALLIANCE GLASS WORKS, LTD.—A petition for the winding up by the High Court of Justice was on May 13, 1921, presented to the Court by William Woodley and Frederick Samuel Beard, who carry on business as Woodley & Beard, at 98A, West India Dock Road, Limehouse, London, creditors of the Company, and will be heard before the Court sitting at the Royal Courts of Justice, Strand, London, on June 7, 1921. Philbrick & Co., 61, Carey Street, Lincoln's Inn, London, W.C. 2, Solicitors for the Petitioners.

NOTE.—Any person who intends to appear on the hearing must notify the above named not later than 6 p.m. on June 6, 1921.

PARRY PURE DRUG CO., LTD.—A petition for the winding up by the County Court of Surrey, was on May 18, 1921, presented to the Court by Gustave Leclercq and Louis Charerat, 15-16, Cullum Street, London, trading as the Cellophane Company, artificial silk manufacturers, and will be heard before the Court sitting at the Court House, Garratt Lane, Wandsworth, on June 20, at 10.30 a.m. Harris, Cheetham and Cohen, 25, Finsbury Square, London, E.C. 2., Solicitors for the Petitioner.

NOTE.—Any person who intends to appear on the hearing of the petition, must notify the above named not later than 6 p.m., on June 18, 1921.

Companies Winding Up Voluntarily.

BRITISH CELLULOSE AND CHEMICAL MANUFACTURING CO., LTD. (the old operating Company in Voluntary Liquidation).—A general meeting of members of the Company will be held at 8, Waterloo Place, London, S.W. 1, on Friday July 1, 1921, at 10 a.m. Linklaters and Paines, 2, Bond Court, Walbrook, E.C.4, Solicitors for Liquidator.

ELECTRO-CHEMICAL DEVELOPMENTS, LTD. (In Voluntary Liquidation).—A general meeting of members of the Company will be held at Waye, near Ashburton, Devon, on Monday, July 4, 1921, at 12 noon. E. A. Ashcroft, Liquidator.

THE UNITED GLASS BOTTLE MANUFACTURERS (CHARLTON), LTD. (Voluntary Liquidation for the purpose of Reconstruction).—A meeting of creditors will be held at 40/43, Norfolk Street, Strand, London, on Wednesday, June 15, 1921, at 11 a.m. J. J. Glew, Liquidator.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, created after July 1, 1908, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges which would, if created after July 1, 1908, require registration. The following Mortgages and Charges have been so registered. In each case the total debt, as specified, in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced since such date.*]

ALUMINIUM CORPORATION, LTD., London, E.C.—Reg. May 20, £6,000 mort., to K. M. Clark, Shielbridge, Acharacle, S.O.; charged on land and farm property at Dolgarrog. *£327,180. July 14, 1920.

LIVER GREASE, OIL AND CHEMICAL CO., LTD., Liverpool.—Reg. May 20, £10,000 debs.; general charge. *—June 23, 1920.

ROUMANIAN CONSOLIDATED OILFIELDS, LTD., London, E.C.—Reg. May 24, Trust Deed dated May 9, 1921, securing £750,000 debs. (filed under sec. 93 (3) of the Companies (Consolidation) Act, 1908), present issue £520,300; general charge. *£142,400. December 27, 1920.

Satisfaction

HYDRAULIC ENGINEERING CO., LTD., Chester.—Satisfactions reg. May 24, £20,885, reg. March 13, 1907; £150, reg. May 27, 1907; £1,000, reg. June 24, 1907; £2,465, amount outstanding July 1, 1908; and £2,465, reg. Oct. 5, 1908.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

CASSON CHEMICAL CO., LTD., 44A, Westbourne Grove, London, W., chemists, £16 13s. 1d. March 31.

DAY, W. H., 4A, Mount Pleasant Road, Crouch Hill, varnish maker, £10 14s. April 11.

NOBLES DRUG STORES, LTD., 2, Well Street, Cable Street, E. 1, chemists, £20 19s. 9d. April 13.

POMEROY, F. T., 5, The Exchange, London Road, Thornton Heath, chemist, £20 4s. 9d. April 11.

BLUNT, W. H., & SON, 70, Snow Hill, Birmingham, chemists, £19 18s. 3d. April 13.

THOMAS, J. H., Bryn, Ffynon, Llangeeni, chemist, £10 9s. 9d. April 12.

JAMES, E. W., Mountain Ash, chemist, £10 16s. 4d. April 12.

New Companies Registered

The following list has been prepared for us by Jordan & Sons, Ltd., company registration agents, 116 and 117, Chancery Lane, London, W.C.2:—

AMALGAMATED DINAS SILICA WORKS, LTD., 1, Northampton Place, Swansea. Manufacturers and dealers in silica, &c. Nominal capital, £150,000 in 60,000 7 per cent. cumulated preference shares, and 90,000 ordinary shares of £1 each. Minimum subscription 10 per cent. Directors: D. C. Mitchell.

CHANNON'S PATENT GLUE, LTD., 17, Basinghall Street, E.C. Manufacturers of glue, paint, varnish, &c. Nominal capital, £1,000 in 1,000 ordinary shares of £1 each. Directors: J. W. Goss, E. J. Wright, F. W. Channon. Qualification of directors, one share.

W. J. LEWIS, LTD., 3, Hinckley Road, Leicester. Pharmacist and dispensing chemists. Nominal capital £5,000 in 5,000 shares of £1 each. Directors: E. A. A. Fry, S. J. Farr. Qualification of directors, 100 shares.

NEW WELDING CO., LTD., 26, Rosebery Avenue, E.C. Electric and acetylene welders, &c. Nominal capital, £15,000 in 5,000 preference shares, and 10,000 ordinary shares of £1 each. Directors: A. H. Phillips, C. G. Arnold, E. C. Simper. Qualification of directors, £100.

SIDUCOS, LTD., Chemists and Druggists. Nominal capital, £10,000 in 10,000 shares of £1 each. Directors to be appointed by subscribers. Remuneration of directors £50 each. Chairman £100. Subscribers: H. H. Walton, M. Hackforth-Jones.

The sale of 2,000,000 tons of NITRATE is reported to have been made by the Chilean Nitrate Producers' Association to a nitrate pool in London, at £14 per ton. Shipments are expected to begin in September.

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Dr. E. J. RUSSELL, O.B.E., F.R.S., Director Rothamsted Experimental Station, will write on **SOILS AND MANURES.** E. T. HALNAN, M.A., School of Agriculture, Cambridge, will write on **ANIMAL NUTRITION.** JAS. C. BROWN, P.A.S.I., Vice-Principal Harper Adams Agricultural College, will write on **ARABLE FARMING.** JAMES MACKINTOSH, B.Sc., The National Institute for Research in Dairying, University College, Reading, will write on **DAIRY FARMING.** G. PURVIS, Vice-Principal Monmouthshire Agricultural Institute, Usk, will write on **FARM IMPLEMENTS AND TRACTION.** C. S. ORWIN, Director, Institute for Research in Agricultural Economics, Oxford, will write on **FARM COSTING AND ACCOUNTS.** A. ROEBUCK, N.D.A., Advisor in Agricultural Entomology and Lecturer in Agricultural Biology, Harper Adams Agricultural College, will write on **INSECT PESTS AND FUNGOUS DISEASES.** ALEXANDER LEVIE, F.R.C.V.S., D.V.S.M.Vict., F.R.S.Edin., County Veterinary Educational Officer for Derbyshire, will write on **FIRST AID TO DISEASES OF FARM LIVE STOCK.** DORA G. SAKER, N.D.D., B.D.F.D., Superintendent Dairy, Poultry and Domestic Science, Somerset County Council, will write on **PRACTICAL DAIRYING.** EDWARD BROWN, F.L.S., will write on **POULTRY BREEDING AND KEEPING.**

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